



CONTAMINATION ASSESSMENT REPORT ADDENDUM

ELECTRIC POWER PLANT
BUILDING 103
TRUMAN ANNEX
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

UNIT IDENTIFICATION CODE (UIC): N00213 NAVY CLEAN - DISTRICT I CONTRACT NO. 62467-89D-0317

SEPTEMBER 1993



SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010

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Prepared by:

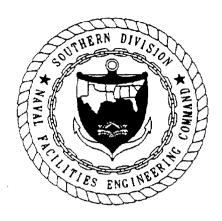
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September 1993



FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (40 CFR 280) (Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks) and Title 40 CFR 281 (Approval of State Underground Storage Tank Programs). Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of Chapter 17-770, Florida Administrative Code (FAC) (State Underground Petroleum Environmental Response), regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Commanding Officer, Naval Air Station (NAS) Key West, Florida, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at 803-743-0613.

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GLOSSARY

ABB-ES ABB Environmental Services, Inc.

BDL below detection limits

BTEX benzene, toluene, ethylbenzene, and xylenes

bls below land surface

CA contamination assessment
CAP Contamination Assessment Plan
CAR Contamination Assessment Report
CFR Code of Federal Regulations

CompQAP Comprehensive Quality Assurance Plan

CTO Contract Task Order

FAC Florida Administrative Code

FDEP Florida Department of Environmental Protection FDER Florida Department of Environmental Regulation

FID flame ionization detector

HSWA Hazardous and Solid Waste Amendments of 1984

ID inside diameter

IRA Initial Remedial Action

msl mean sea level

MOP Monitoring Only Plan MTBE methyl tert-butyl ether

NAS Naval Air Station

NGVD National Geodetic Vertical Datum

NOAA National Oceanic and Atmospheric Administration

NOFAP No Further Action Plan

OVA organic vapor analyzer

PAH polynuclear aromatic hydrocarbons

POA Plan of Action

ppb parts per billion

ppm parts per million

PVC polyvinyl chloride

RAP remedial action plan

SOUTHNAV -

FACENGCOM Southern Division, Naval Facilities Engineering Command

SPT standard penetration test

SWDA Solid Waste Disposal Act of 1965

TRPH total recoverable petroleum hydrocarbons

GLOSSARY (Continued)

UIC unit identification code

United States Environmental Protection Agency USEPA

United States Geological Survey underground storage tank USGS

UST

VOA volatile organic aromatics

1.0 INTRODUCTION

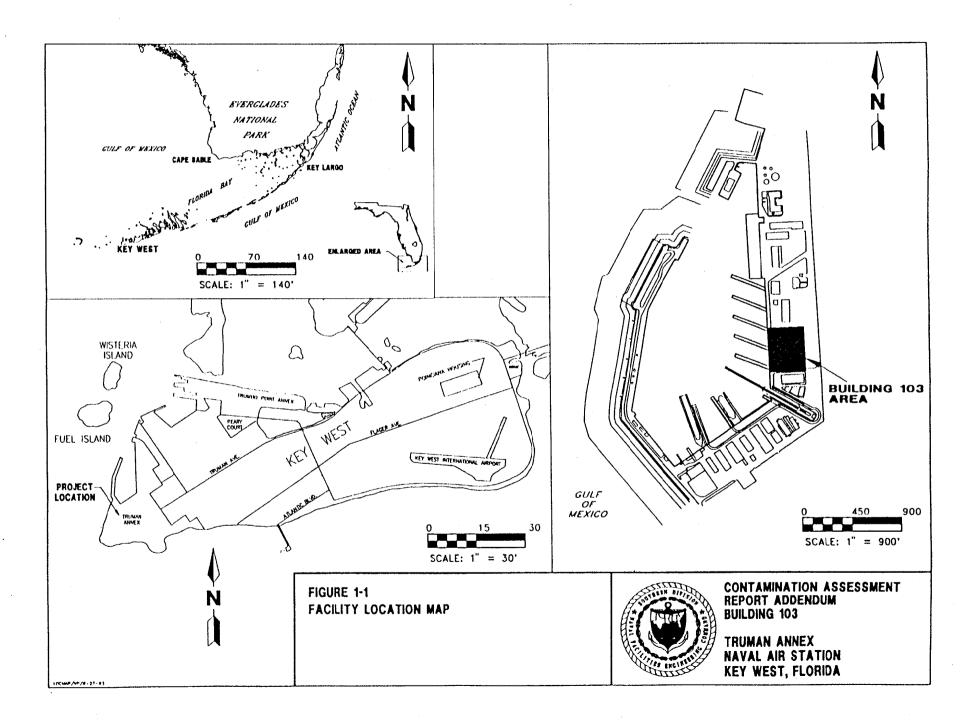
ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a contamination assessment report (CAR) for the Electric Power Plant, Building 103, Truman Annex, Naval Air Station (NAS), Key West, Monroe County, Florida (Figure 1-1). The Electric Power Plant Site (Site 103) consists of a former underground storage tank (UST) location. Free product was reported in the vicinity of the UST during excavation. As a result, a CA was required and conducted to identify and assess the extent of the petroleum contamination.

The scope of services provided by ABB-ES to SOUTHNAVFACENGCOM during the CA were defined by and performed under Contract Task Order (CTO) No. 007, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and included the following:

- installing soil borings and monitoring wells,
- collecting and analyzing groundwater and soil samples to assess the extent of petroleum contamination,
- measuring water levels and collecting groundwater elevation data,
- performing an inventory of potable wells within a 0.25-mile radius of the site.
- · performing slug tests to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the contamination assessment to complete a CAR.

The field investigation for the CA of the Building 103 site was initiated in August 1991 and supplemented in April 1992. A CAR was submitted in June 1992 to the Florida Department of Environmental Regulation (currently the Florida Department of Environmental Protection [FDEP]). At the request of FDEP, supplemental field investigation activities were conducted at the site. These activities were conducted through August 1993.

This report is an addendum to the original CAR and presents the findings, conclusions, and recommendations of the supplemental field investigation. For simplicity, the prefix KYW-103 has been dropped from soil boring and monitoring well designations in the text, tables, and figures of this report.



2.0 SITE HISTORY

2.1 SITE BACKGROUND. Building 103 was formerly the Electric Power Plant for the Truman Annex facility. The initial area of concern was the former location of a waste oil UST, located on the north side of Building 103 (Figure 2-1). In January 1991 after a heavy rain, petroleum product was observed on the land surface over the location of the waste oil UST. The UST was excavated and removed from the site. During tank removal activities, free product was observed floating on the water in the excavation pit. According to Navy personnel, petroleum-contaminated soil was removed from the UST excavation, stockpiled adjacent to the excavation pit, and returned to the excavation after the UST was removed.

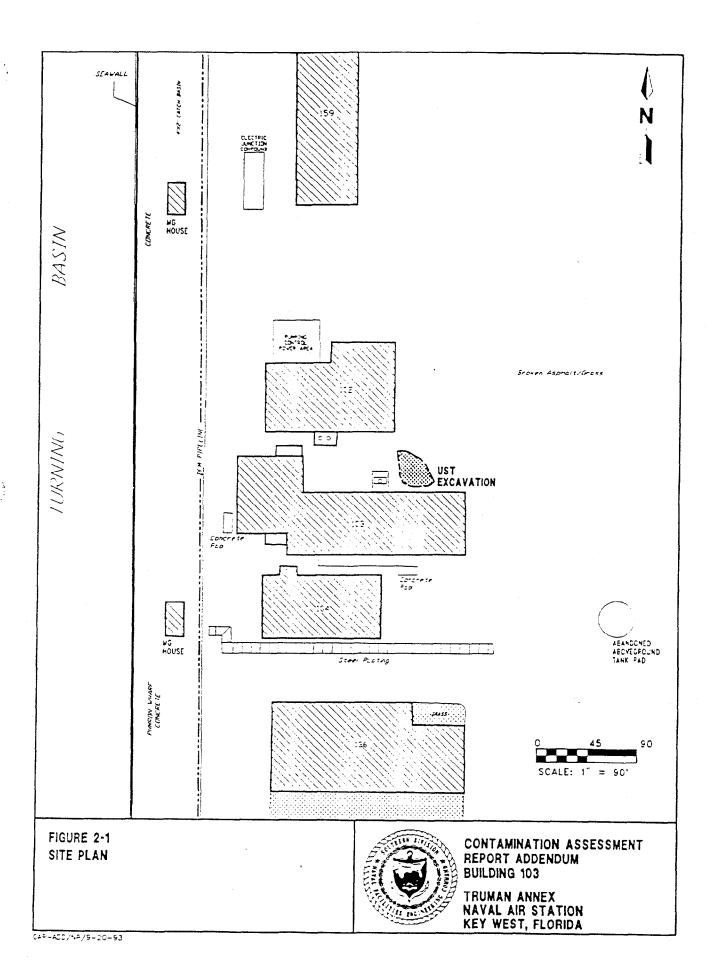
2.2 1991-1992 CONTAMINATION ASSESSMENT. Field investigations for the CA at the Building 103 site were performed by ABB-ES in July and August 1991 and April 1992. The objectives of the CA were to identify petroleum contaminants at the site, assess the degree and extent of petroleum contamination in soil and groundwater, and recommend a feasible course of action to comply with State target levels. Soil boring and monitoring well locations are shown in Figure 2-2.

During July 24 through August 8, 1991, 22 soil borings, SB-1 through SB-22, were advanced using hollow-stem auger drilling techniques. Soil samples were collected from each boring and analyzed with an organic vapor analyzer (OVA). Monitoring wells MW-1 through MW-11 were installed in selected borings. On August 14 and 15, 1991, groundwater samples were collected from each monitoring well and analyzed for the kerosene analytical group, pursuant to Chapter 17-770, Florida Administrative Code (FAC). The groundwater sampling results for August 14 and 15, 1991, are summarized in Table 2-1.

On April 8, 1992, two additional soil borings, SB-23 and SB-24, were advanced. Soil samples were collected from each boring and analyzed with an OVA. Monitoring wells MW-12, MW-13, and MW-14 were also installed in additional borings. On April 9, 1992, groundwater samples were collected from monitoring wells MW-3, MW-4, MW-8, MW-12, MW-13, and MW-14 and a pre-existing site well designated MW-15. Groundwater samples were analyzed for kerosene analytical group parameters. The groundwater sampling results for April 9, 1992, are summarized in Table 2-2.

The findings of the 1991 and 1992 CA field investigations are summarized below.

- Groundwater flow direction at the site is tidally influenced. The predominant groundwater flow direction, however, appears to be westerly toward the turning basin.
- Groundwater in the Key West area is classified as G-III groundwater (McKenzie, 1990).
- No known potable wells were identified within a 0.25-mile radius of the site.



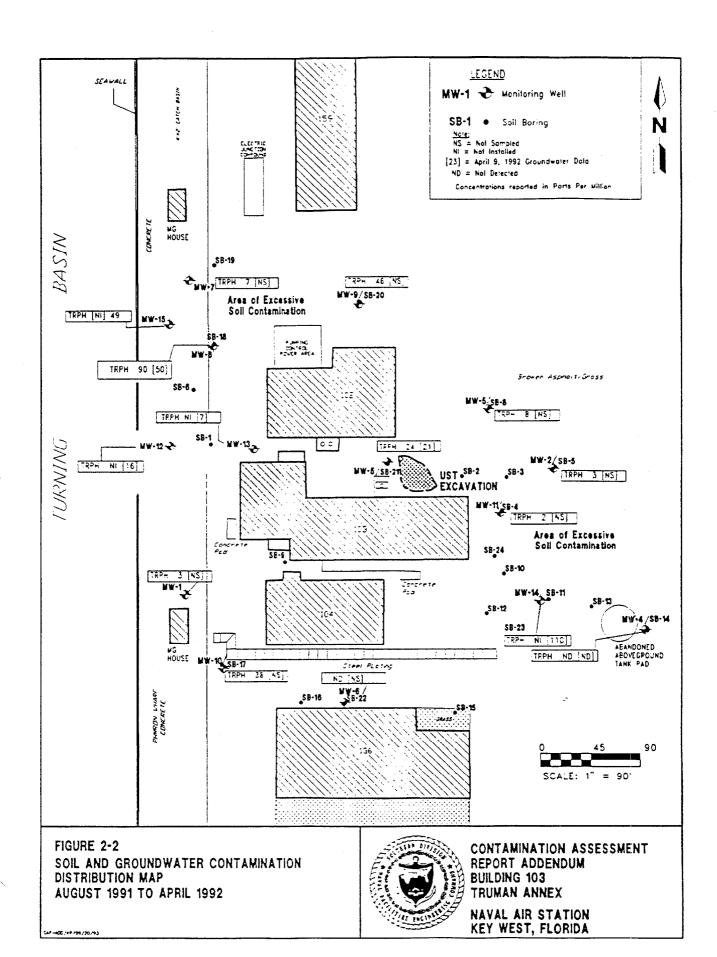


Table 2-1 Summary of Groundwater Sample Laboratory Analyses, August 14 and 15, 1991

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

	'State Tai	rget Levels	_										
Compound	Source Wells	Perimeter Wells	MW-1	MW-2	²MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Benzene	500	200	ND	ND	2	ND	ND						
Total VOA	1,000	200	1	ND	7	ND	1	ND	ND	1	ND	ND	ND
Total PAH	None	None	ND	ND	34	ND	ND						
Total naphthalene	None	None	ND	ND	368	ND	ND	ND	ND	77	ND	ND	ND
Lead	1,000	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRPH	100	5	3	3	24	ND	8	ND	7	90	46	38	2

¹ State target level for Class G-III groundwater (FDER, October 1990).

Notes: All concentrations are in parts per billion, except TRPH which is in parts per million.

ND = not detected.

Total VOA = total volatile organic aromatics; the sum of benzene, ethylbenzene, toluene, and xylenes.

Total PAH = the sum of polynuclear aromatic hydrocarbons, excluding total naphthalene.

Total naphthalene = the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

TRPH = total recoverable petroleum hydrocarbons.

² Source well. Other wells are considered to be perimeter wells.

Table 2-2 Summary of Groundwater Sample Laboratory Analyses, April 9, 1992

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

	¹State Tar	get Levels							
Compound	Source Wells	Perimeter Wells	MW-3	MW-4	MW-8	MW-12	MW-13	² MW-14	MW-15
Benzene	500	200	1	ND	ND	1	ND	17	ND
Total VOA	1,000	200	14	CM	ND	32	ND	56	ND
Total PAH	None	None	37	DM	15	1.950	ND	מא	20
Total naphthalene	None	None	309	ND	ND	2,530	ND	660	ND
Lead	1,000	50	ND	СИ	ND	26	ND	ND	ND
TRPH	100	5	21	ND	50	16	7	110	49

¹ State target level for Class G-III groundwater (FDER, October 1990).

Notes: All concentrations are in parts per billion, except TRPH which is in parts per million.

ND = not detected.

Total VOA = total volatile organic aromatics; the sum of benzene, ethylbenzene, toluene, and xylenes.

Total PAH = the sum of polynuclear aromatic hydrocarbons, excluding total naphthalene.

Total naphthalene = the sum of naphthalene. 1-methylnaphthalene, and 2-methylnaphthalene.

TRPH = total recoverable petroleum hydrocarbons.

² Source well. Other wells are considered to be perimeter wells.

- Excessive soil contamination was identified in two areas (Figure 2-2): (1) an area in the vicinity of monitoring well MW-14, located west of an abandoned aboveground tank pad in the southeastern section of the site; and (2) an elongated area centered near the western edge of Building 102 in the western part of the site in the vicinity of monitoring wells MW-7, MW-8, and MW-13.
- No petroleum-contaminated soil was identified by OVA headspace analysis
 in the boring for monitoring well MW-3, located on the western edge of
 the former waste oil UST excavation.
- Total Recoverable Petroleum Hydrocarbons (TRPH) groundwater concentrations exceeded the State target level of 5 parts per million (ppm) for Class G-III groundwater (FDER, 1990) in the samples collected from 10 monitoring wells at the site (monitoring wells MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-12, MW-13, MW-14, and MW-15). The distribution of TRPH contamination is illustrated in Figure 2-2. TRPH was the only groundwater contaminant detected that exceeded State target levels.
- · Free product was not detected in any of the monitoring wells.

A CAR was submitted for the Building 103 site in September 1992 to FDEP and a Monitoring Only Plan (MOP) was recommended and outlined for the site. After reviewing the CAR, FDEP requested a supplemental investigation be performed to further delineate the extent of soil and groundwater contamination.

- 2.3 SCOPE OF SUPPLEMENTAL INVESTIGATION. The scope of the supplemental field investigation at the Building 103 site requested by FDEP is outlined in the correspondence dated August 31, 1992, which is included in Appendix A. FDEP's requests are summarized below.
 - Conduct a supplemental soil assessment around the former waste oil UST area.
 - Provide documentation regarding the soil Initial Remedial Action (IRA) performed during removal of the former waste oil UST.
 - Install two monitoring wells in the vicinity of the excavated waste oil UST area, two monitoring wells in the vicinity of monitoring well MW-9, and an intermediate depth well adjacent to monitoring well MW-12.
 - Conduct groundwater sampling of all site monitoring wells.
 - Collect surface water and sediment samples in the area between monitoring wells MW-12 and MW-15.
 - Verify the 1991 and 1992 laboratory analyses presented in the CAR.
 - Provide construction details of monitoring well MW-15, which existed prior to the investigation.

On March 10, 1993, ABB-ES met with FDEP to discuss the manner and scope of the supplemental field investigation. It was mutually agreed that in addition to the

wells requested by FDEP in the August 31, 1992, correspondence, additional monitoring wells would also be required along the perimeter of the site to further assess the extent of TRPH groundwater contamination. A copy of the March 10, 1993, meeting minutes is included in Appendix A.

The initial phase of the supplemental investigation was conducted in March 1993 and involved the following:

- drilling 44 additional soil borings (SB-25 through SB-68),
- installing 15 additional groundwater monitoring wells (MW-16 through MW-30),
- sampling all site monitoring wells, and
- collecting one surface water and one sediment sample in the vicinity of the area between monitoring wells MW-12 and MW-15 near the seawall.

After completing the initial phase of the supplemental investigation, a meeting was held with FDEP, ABB-ES, and Navy representatives on May 26, 1993, to discuss the recent findings at the site. It was mutually agreed that a deep monitoring well would be installed to assess the vertical extent of groundwater contamination in the vicinity of monitoring well MW-12 and that the groundwater sample collected from this well would be analyzed for used oil constituents. In addition, a sediment sample was to be collected from the oceanward side of the seawall and analyzed for used oil constituents to assess the possibility of petroleum contamination migrating under the seawall. A copy of the May 26, 1993, meeting minutes is included in Appendix A.

The second phase of the supplemental assessment began in June 1993 and was completed in August 1993. During this period, four additional soil borings (SB-69 through SB-72) were advanced, six sediment samples were collected, and one deep monitoring well (MW-31D) was installed and sampled.

The results of the supplemental assessment are discussed in Section 3.0.

3.0 METHODOLOGIES AND EQUIPMENT

3.1 SOIL BORING AND SOIL SAMPLING PROGRAM. Fifty-three soil borings, SB-25 through SB-78, were advanced at the site during the assessment conducted March through August 1993. All soil boring locations are shown in Figure 3-1. Soil borings SB-22 through SB-69 were drilled to further assess the extent of excessive petroleum contamination estimated in the 1991-92 assessment. Soil borings SB-70, SB-71, and SB-72 were drilled adjacent to monitoring wells MW-13, MW-16, and MW-14, respectively, to confirm excessive soil contamination in these areas.

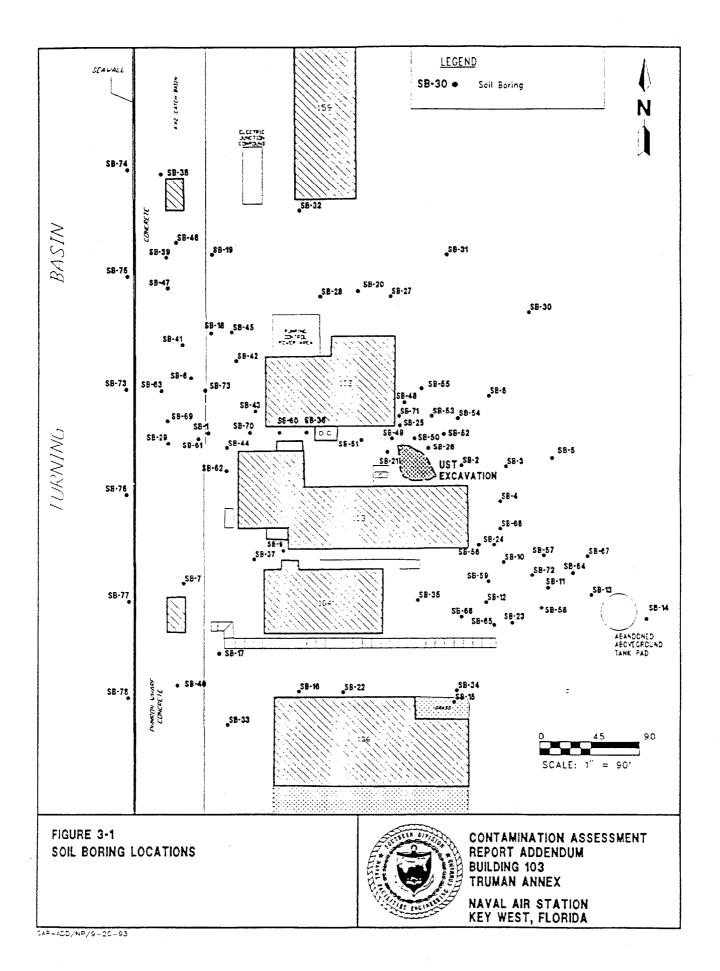
Soil borings were advanced using hollow-stem auger drilling techniques. Where possible, soil samples were collected at 1-foot below land surface (bls) and every 2 feet vertically thereafter until the soil-groundwater interface was encountered. Groundwater was generally encountered at a depth of 6 to 7 feet bls. Once the water table was encountered, sampling continued at 5-foot intervals until total depth of the boring was reached.

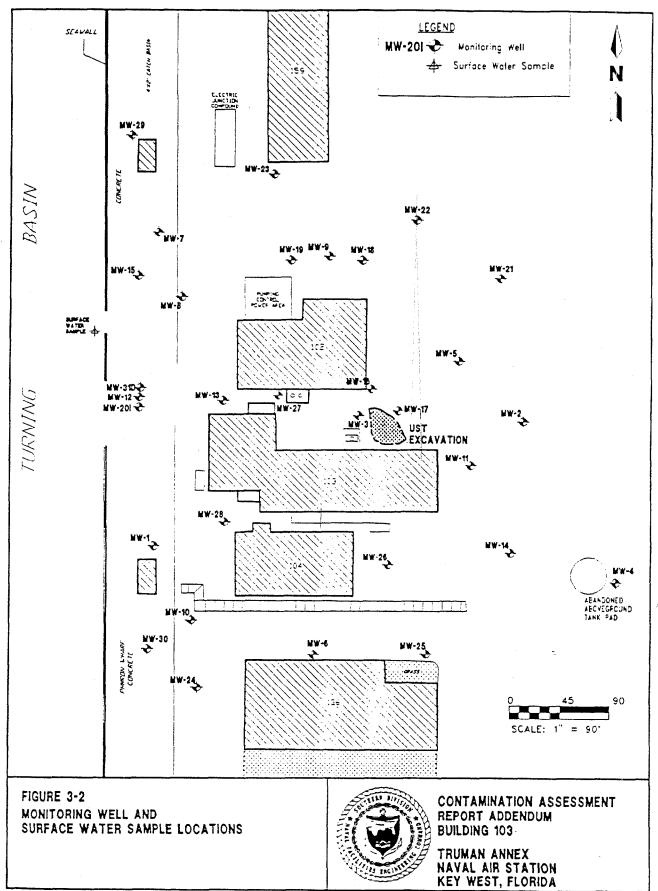
Soil samples were collected above the water table with a split-spoon sampling device in accordance with ABB-ES' FDEP approved Comprehensive Quality Assurance Plan (CompQAP). Samples were placed in glass jars, which were then sealed and analyzed with an OVA equipped with a flame ionization detector (FID). Soil samples collected from borings SB-70 through SB-72 were shipped via overnight carrier to a State certified laboratory for TRPH analysis. OVA headspace analysis was not performed on the samples collected from these borings.

One soil sample was collected from soil boring SB-63, which is located between monitoring wells MW-12 and MW-15 near the seawall. The soil sample was collected at a depth of 3 to 5 feet bls and analyzed for used oil constituents as requested by FDEP.

Soil analytical results are attached in Appendix B, Soil Analytical Data, and are discussed in Section 4.1.

- 3.2 SEDIMENT SAMPLING PROGRAM. In addition to the soil sampling, sediment samples were collected to assess the possibility that petroleum contamination may be migrating beneath the seawall. Six sediment samples (SB-73 through SB-78) were collected on the seaward side of the seawall at approximately 100-foot intervals using a split-spoon sampling device. Sediment samples were collected at a depth of 0 to 2 feet from the turning basin floor. The depth of water at the seawall is approximately 33 feet. All sediment samples were analyzed for TRPH. The sediment sample collected at SB-73 was analyzed for used oil constituents. All sediment samples were collected in accordance with the procedures described in ABB-ES' CompQAP.
- 3.3 MONITORING WELL INSTALLATION PROGRAM. Sixteen monitoring wells, MW-16 through MW-31D, were installed during the supplemental investigation. In March 1993, monitoring wells MW-16 through MW-30 were installed in soil borings SB-25 through SB-40, respectively. A deep monitoring well, MW-31D, was installed in soil boring SB-69 in June 1993. The locations of all site monitoring wells are shown in Figure 3-2.





Monitoring wells were constructed of 2-inch inside diameter (ID), Schedule 40, polyvinyl chloride (PVC) casing. Shallow monitoring wells were generally installed to a depth of 13 to 14 feet bls. The lower 10 feet of each shallow well were screened with 2-inch ID, Schedule 40 PVC, 0.020-inch slotted well screen. The intermediate depth well, MW-201, installed in the vicinity of monitoring well MW-12 was installed to a depth of 32 feet bls. The lower five feet were screened with 2-inch ID, Schedule 40 PVC, 0.020-inch slotted well screen.

A 6/20 grade silica sand filter pack was placed in the annular space around each well to approximately 2 feet above the top of the screen. A 6- to 12-inch thick bentonite seal was then placed on top of the filter pack. The remaining annular space was grouted to the surface with Portland Type I cement. The shallow water table conditions necessitated limiting the thickness of the sand filter pack, bentonite seal, and grout above the screened interval.

The deep monitoring well, MW-31D, was installed to a depth of 55 feet bls. MW-31D is double-cased, with 6-inch ID, Schedule 40 PVC casing installed to a depth of 45 feet bls. The riser pipe is constructed of 2-inch ID, Schedule 40, PVC. The lower 5 feet of the well consists of 2-inch ID, Schedule 40 PVC, 0.020-inch slotted well screen. Filter pack, bentonite seal, and grout details for the deep well are similar to those of the shallow and intermediate monitoring wells.

A protective traffic-bearing steel vault was installed to protect and complete each well. Each monitoring well was equipped with a 6-inch flush mount vault and a locking well cap. Shallow and intermediate monitoring well construction and installation details are presented in Figure 3-3. Well construction and installation details for the deep monitoring well are presented in Figure 3-4.

Monitoring well MW-15 was installed prior to these investigations. Visual inspection of the well indicates it is constructed of 4-inch ID, PVC casing. The total depth of the well is approximately 15 feet bls. It is assumed that the screen interval of the well brackets the water table. No other construction details for MW-15 were readily available.

3.4 GROUNDWATER ELEVATION SURVEY. Groundwater elevation measurements were recorded for each shallow monitoring well on March 28 and August 25, 1993. Depth to groundwater was measured using an electronic water-level indicator. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation of the top of the well casing. Water table elevation contour maps were constructed for each date using this information and are discussed in Section 4.2.

It should be noted that the top of casing measurements were referenced to the top of casing elevation for monitoring well MW-1, which was arbitrarily set at 10.00 feet. Hence, top of casing elevations and calculated water table elevations do not reflect water table elevations relative to the National Geodetic Vertical Datum (NGVD) of 1929.

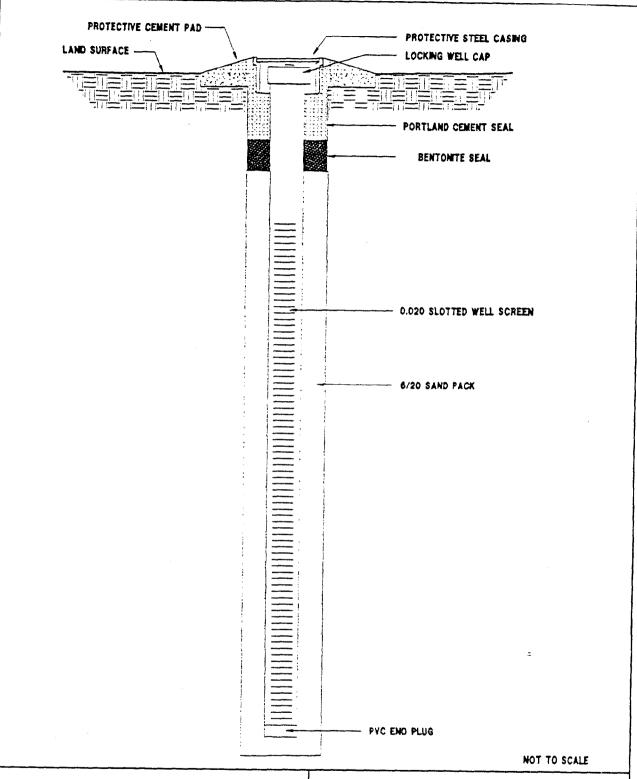


FIGURE 3-3
TYPICAL SHALLOW AND INTERMEDIATE
MONITORING WELL INSTALLATION DETAIL



CONTAMINATION ASSESSMENT REPORT ADDENDUM BUILDING 103 TRUMAN ANNEX NAVAL AIR STATION KEY WEST KEY WEST, FLORIDA

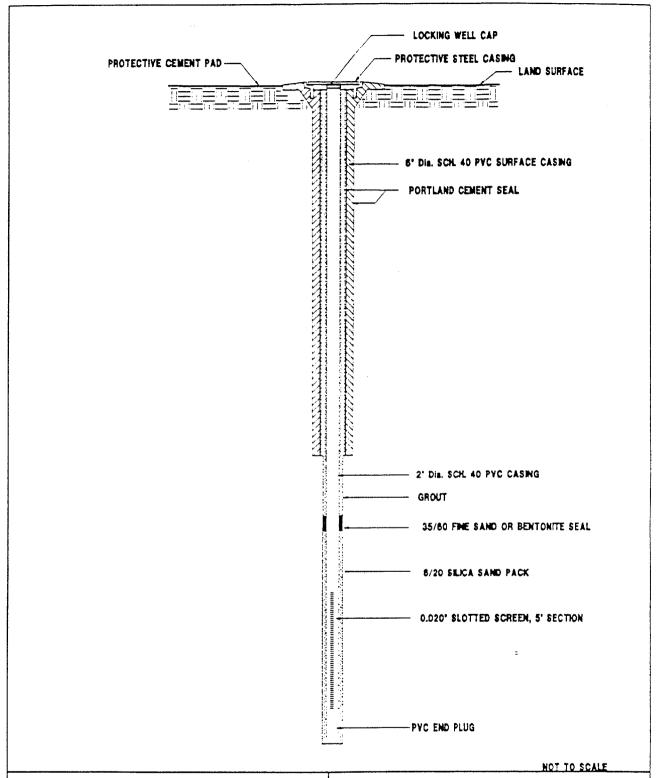


FIGURE 3-4
TYPICAL DEEP MONITORING WELL
INSTALLATION DETAIL



CONTAMINATION ASSESSMENT REPORT ADDENDUM BUILDING 103 TRUMAN ANNEX NAVAL AIR STATION KEY WEST KEY WEST, FLORIDA 3.5 GROUNDWATER SAMPLING PROGRAM. Groundwater samples were collected from monitoring well MW-1 through MW-30 on March 28 through March 30, 1993. The deep monitoring well, MW-31D, was sampled on June 10, 1993. Groundwater samples were collected in accordance with ABB-ES' CompQAP. A minimum of five well volumes was purged from each monitoring well before sampling. Groundwater samples were collected using an extruded Teflon™ bailer. The groundwater samples were placed in appropriate containers, preserved, and packed on ice. They were then shipped to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida.

The samples collected from monitoring wells MW-3, MW-12, MW-16, MW-17, and MW-31D were analyzed for used oil constituents. All other groundwater samples were analyzed for USEPA Methods 418.1, 602 (including methyl tert-butyl ether [MTBE]), 610, and priority total metals. Duplicate samples were collected from monitoring wells MW-1, MW-8, and MW-25. Equipment and trip blanks were also collected and analyzed as appropriate. Groundwater analytical results are included in Appendix C and are discussed in Section 4.2. In Appendix C, the sample collected from monitoring well MW-20I is incorrectly identified on the laboratory reporting sheets as MW-20D.

3.6 SURFACE WATER SAMPLING PROGRAM. A surface water sample was collected March 30, 1993, on the seaward side of the seawall, between monitoring wells MW-12 and MW-15 (Figure 3-2). The sample was collected in accordance with ABB-ES' CompQAP. The sample was placed into appropriate labeled containers, placed on ice, and shipped with complete chain of custody to Wadsworth/ALERT Laboratories in Tampa, Florida. The sample was analyzed for used oil parameters. Surface water analytical results are discussed in Section 4.3.

4.0 SUPPLEMENTAL ASSESSMENT RESULTS

- 4.1 SOIL AND SEDIMENT ASSESSMENT RESULTS. Descriptions of lithologies encountered in each boring drilled during the 1993 supplemental assessment are attached in Appendix D, Lithologic Logs. Site-specific lithologies are described in the CAR submitted in September 1992 by ABB-ES.
- 4.1.1 Soil Assessment Results. Tables 4-1 and 4-2 summarize the results of the OVA headspace analyses and TRPH laboratory analyses for soil samples collected during the supplemental assessment. Figure 4-1 illustrates the approximate areal extent of soil contamination. OVA soil data from the 1991, 1992, and 1993 field investigations have been combined to assess the extent of soil contamination. TRPH concentrations from laboratory analysis of soil and sediment samples are indicated in brackets on the figure.

The horizontal and vertical extent of excessively contaminated soil (TRPH concentrations >50 parts per million [ppm] and OVA headspace readings >50 ppm) was assessed in the vicinity of the former waste oil UST near the southeast corner of Building 102, but does not coincide with the reported excavation area. The areal extent of soil contamination of the areas near monitoring well MW-14 and along the western edge of Building 102 has been further delineated.

One soil sample was analyzed for used oil parameters. The soil sample was collected from SB-63 located near the seawall between monitoring wells MW-12 and MW-15. Barium, chromium, lead, and TRPH were detected in the sample collected from SB-63 at concentrations of 9.7 ppm, 9.4 ppm, 16 ppm, and 37 ppm, respectively (Table 4-3). Barium, chromium, and lead concentrations are well below the State metals standards for clean soil of 2,750 ppm, 275 ppm, and 77 ppm, respectively (FDER, May 1992). The concentration of TRPH (37 ppm) is below the State standard for TRPH in clean soil of 50 ppm (FDER, May 1992). Decanal was detected as a tentatively identified compound, at an estimated concentration of 0.24 ppm. No other contaminants were detected in this sample.

4.1.2 Sediment Sample Analytical Results TRPH contamination (TRPH concentrations >10 ppm) was detected in the turning basin sediment samples collected along the seawall (Figure 4-1). Laboratory TRPH concentrations vary from 9 ppm detected in the sample collected from SB-77, to 97 ppm in the sample from SB-74. Although TRPHs were detected in all the samples, excessively contaminated sediment (TRPH concentrations >50 ppm) was found in only the samples collected from SB-73 and SB-74.

The sediment sample from SB-73 was collected on the seaward side of the seawall, approximately 30 feet west of SB-63 and was analyzed for used oil constituents. Acetone, ethylbenzene, arsenic, chromium, and TRPH were detected in the sample (Table 4-3). Acetone and ethylbenzene concentrations were 27 parts per billion (ppb) and 2 ppb, respectively. The combined total VOA concentration (including acetone) of 29 ppb is well below the State target level for total VOA of 100 ppb (FDER, May 1992). Arsenic and chromium concentrations were 0.8 ppm and 11 ppm, respectively, which are well below their respective State target levels of 55 ppm and 275 ppm (FDER, May 1992). TRPH concentrations (78 ppm) exceed the organic standard for clean soil of 10 ppm. The compounds trans-octahydro-2,2,4,4,7,7-hexamethyl 1H-indene, 1-(1,3-dimethyl-3-butenyl)-4-fluorobenzene, and molecular

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-25	0.0 to 1.0	1
	1.0 to 3.0	<1
	3.0 to 5.0	460
	5.0 to 7.0	80
SB-26	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	2
SB-27	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
	5.0 to 7.0	10
SB-28	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1 .
SB-29	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-30	0.0 to 1.0	<1
	1.0 to 3.0	2
	3.0 to 5.0	<1
SB-31	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-32	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-33	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	2

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-25	0.0 to 1.0	1
	1.0 to 3.0	<1
	3.0 to 5.0	460
	5.0 to 7.0	80
SB-26	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	2
SB-27	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
	5.0 to 7.0	10
SB-28	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-29	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-30	0.0 to 1.0	<1
	1.0 to 3.0	2
	3.0 to 5.0	<1
SB-31	0.0 to 1.0	<1
	1.0 to 3.0	<1 =
	3.0 to 5.0	<1
SB-32	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-33	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	2
See notes at end of table.		

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-34	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-35	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-36	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-37	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-38	0.0 to 1.0	5
	1.0 to 3.0	3
	3.0 to 5.0	2
SB-39	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-40	0.0 to 1.0	NS
	1.0 to 3.0	NS
	3.0 to 5.0	NS
SB-41	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	9
SB-42	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	1
SB-43	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	30

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-44	0.0 to 1.0	90
	1.0 to 3.0	30
	3.0 to 5.0	20
SB-45	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-46	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-47	0.0 to 1.0	<1
	1.0 to 3.0	1
	3.0 to 5.0	<1
SB-48	0.0 to 1.0	2
	1.0 to 3.0	7
	3.0 to 5.0	23
SB-49	0.0 to 1.0	18
	1.0 to 3.0	12
	3.0 to 5.0	121
SB-50	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-51	0.0 to 1.0	1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-52	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	50
SB-53	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	35

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-54	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	4
SB-55	0.0 to 1.0	1
	1.0 to 3.0	<1
	3.0 to 5.0	13
SB-56	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	13
SB-57	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	26
SB-58	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-59	0.0 to 1.0	<1
	1.0 to 3.0	1
	3.0 to 5.0	3
SB-60	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-61	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-62	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	NS
B-63	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	NM
ee notes at end of table.		

Contamination Assessment Report Addendum Site 103, Truman Annex NAS Key West, Florida

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace/TRPH Reading (ppm)
SB-64	0.0 to 1.0	<1
	1.0 to 3.0	1
	3.0 to 5.0	79
SB-65	0.0 to 1.0	<1
	1.0 to 3.0	3
	3.0 to 5.0	7
SB-66	0.0 to 1.0	2
	1.0 to 3.0	<1
	3.0 to 5.0	<1
SB-67	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	8
SB-68	0.0 to 1.0	<1
	1.0 to 3.0	4
	3.0 to 5.0	3
SB-69		NM

Notes: TRPH = total recoverable petroleum hydrocarbons.

ppm = parts per million. NS = not sampled.

NM = not measured.

Table 4-2 Summary of Total Recoverable Petroleum Hydrocarbon (TRPH) Laboratory Analytical Results, June 8 through August 25, 1993

Contamination Assessment Report Addendum Site 103, Truman Annex NAS Key West, Florida

Depth Below Land Surface (feet)	TRPH Concentration (ppm)
3 to 5	. 390
3 to 5	290
3 to 5	320
0 to 2	78
0 to 2	97
0 to 2	24
0 to 2	36
0 to 2	9
0 to 2	10
	(feet) 3 to 5 3 to 5 3 to 5 0 to 2

Tru_103.CAR MVL 09.93

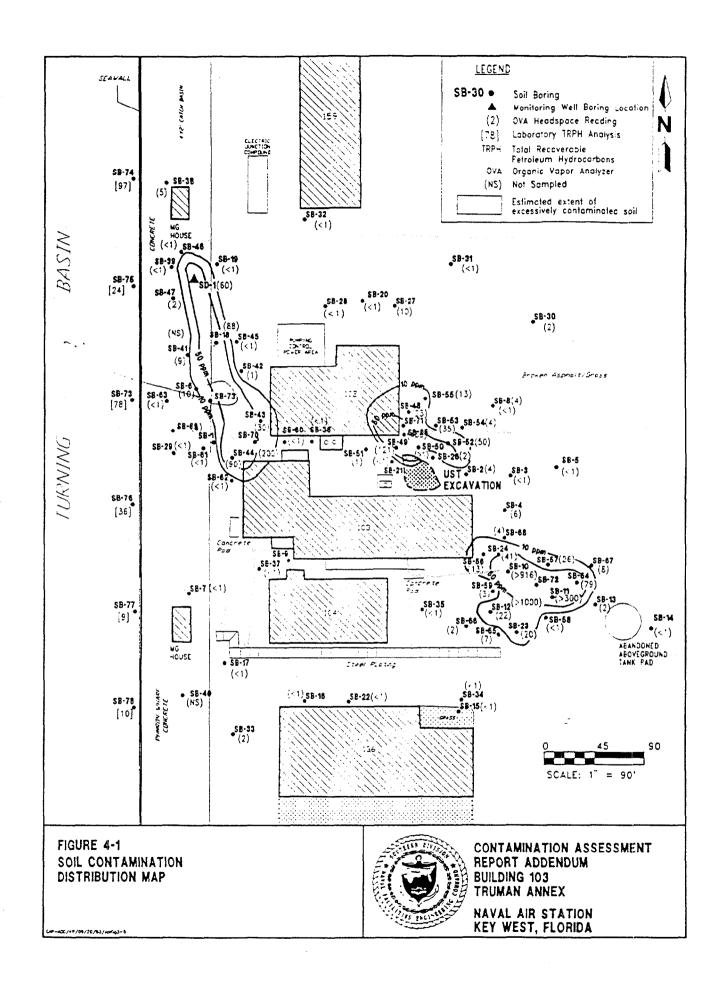


Table 4-3 Summary of Used Oil Analyses, Soil Borings KYW-103-SB63 and KYW-103-SB73

Contamination Assessment Report Addendum Site 103, Truman Annex NAS Key West, Florida

Compound	State Soil Standard ¹	SB-63 ²	SB-73 ²
Total VOA	100	ND	29
Arsenic	55	ND	0.8
Barium	2750	9.7	ND
Chromium	275	9.4	11
Lead	77	16	ND
TRPH	50	37	78
Tentatively Identified Compounds ³ (TICs)			
Decanal		0.24	ND
Trans-octahydro-2.2.4.4.7,7-hexamethyl 1H-indene		ND	0.51
1-(1,3-dimethyl-3-butenyl)-4-fluorobenzene		ND	0.14
Molecular sulfur		ND	0.15
Unknowns		ND	1.0
Total TIC		0.24	1.81

¹State soil standard (FDER, May 1992).

Notes: All concentrations are in parts per million, except total VCA which is in parts per billion.

ND = not detected.

Total VOA = total volatile organic aromatics; the sum of benzene, ethylbenzene, toluene, and xylenes.

TRPH = total recoverable hydrocarbon.

Total TIC = the sum concentration of tentatively identified compounds.

²The soil sample from SB-63 was collected on March 25, 1993. The soil sample from SB-73 was collected on June 10, 1993).

³Concentrations of tentatively identified compounds are estimated.

sulfur were detected as tentatively identified compounds with estimated concentrations of 0.51 ppm, 0.14 ppm, and 0.15 ppm, respectively. Four unknowns having a combined concentration of 1.0 ppm were also detected. No other contaminants were detected.

4.2 GROUNDWATER ASSESSMENT RESULTS.

4.2.1 Groundwater Flow Direction Depth to groundwater measurements were recorded in all site monitoring wells on March 28, 1993, and August 25, 1993. Top of casing, depth to groundwater, and water table elevation data are presented in Table 4-4.

In August 1991, a tidal influence study conducted at the site indicated that groundwater flow direction in the surficial zone is tidally influenced, with the predominant flow direction toward the west (ABB-ES, 1992). The March 28, 1993, data are reasonably consistent with the August 1991 measurements, indicating variable groundwater flow direction, with a predominant westerly flow direction in the central part of the site (Figure 4-2). The data indicate an easterly flow direction in the concreted area near the seawall, which may be the result of tidal influence. The easterly flow direction near the seawall has caused an apparent piezometric "trough", which varies from approximately 25 to 100 feet in width and extends from the northern to southern limits of the site near the western edges of Buildings 102, 103, 104, and 136. Water level data indicate a piezometric "high" in the immediate vicinity of the former waste oil UST that is inferred to extend to the south near monitoring wells MW-26 and MW-25. "high" results in an easterly groundwater flow direction in the vicinity of monitoring wells MW-11 and MW-14 and significant variations in flow direction in the vicinity of the former waste oil UST.

The August 25, 1993, data indicate a variable, but predominantly westerly, groundwater flow direction across the site, notably, in the vicinity of the seawall (Figure 4-3). There is a piezometric "trough" centered between Buildings 102 and 103 in the central part of the site. Groundwater flows to the north toward the "trough" from the southern part of the site and to the south in the direction of the "trough" from the northern part of the site. A westerly flow direction toward the "trough" is indicated in the western section of the site near monitoring wells MW-11 and MW-14.

- 4.2.2 Groundwater Contamination Groundwater contaminants detected during the supplemental investigation conducted in 1993 include volatile organic aromatics (VOAs), polynuclear aromatic hydrocarbons (PAHs), naphthalenes, TRPH, metals, MTBE, acetone, carbon disulfide, and 1,2-dichloroethane. Groundwater laboratory analytical results are summarized in Table 4-5.
- 4.2.2.1 Total Volatile Organic Aromatics (VOAs) VOAs detected in groundwater samples include benzene, ethylbenzene, toluene, and xylenes (BTEX). VOA were detected in the samples collected from monitoring wells MW-3, MW-9, MW-12, MW-14, MW-20I, MW-23, MW-27, and MW-28 (Figure 4-4). Total VOA (the sum of benzene, ethylbenzene, toluene, and xylenes) concentrations exceeded the State target level of 200 ppb for Class G-III groundwater (FDER, 1990) only in the sample collected from monitoring well MW-28, located near the northwest corner of Building 104. The total VOA concentration detected in the groundwater sample from MW-28 was 326 ppm. The areal extent of total VOA contamination exceeding

Table 4-4 Top of Casing Elevations, Depth to Groundwater Measurements, and Groundwater Elevations, March 28 and August 25, 1993

Contamination Assessment Report Addendum Site 103, Truman Annex NAS Key West, Florida

		March 2	28, 1993	August :	25, 1993
Well Number	Top of Casing Elevation ¹ (feet)	Depth to Water (feet bis)	Groundwater Elevation ¹ (feet)	Depth to Water (feet bls)	Groundwater Elevation ¹ (feet)
MW-1	10.63	5.82	4.81	5.74	4.89
MW-2	12.33	7.20	5.13	7.17	5.16
MW-3	12.38	7.49	4.89	7.33	5.05
MW-4	12.05 🔻	6.97	5.08	6.91	5.14
MW-5	12.03	7.02	5.01	6.84	5.19
MW-6	11.37	6.52	4.85	6.25	5.12
MW-7	10.63	5.59	5.04	5.72	4.91
MW-8	10.68	5.91	4.77	5.63	5.05
MW-9	11.27	6.53	4.74	6.08	5.19
MW-10	10.90	6.15	4.75	5.68	5.22
MW-11	12.21	6.96	5.25	7.17	5.04
MW-12	10.49	5.48	5.01	5.80	4.69
MW-13	11.39	6.64	4.76	6.21	5.18
MW-14	12.08	6.90	5.18	7.88 ²	-
MW-15	10.48	5.72	4.76	5.64	4.84
MW-16	12.51	7.20	5.31	7.57	4.94
MW-17	12.69	7.49	5.20	7.69	5.00
MW-18	11.67	6.82	4.85	6.53	5.14
MW-19	11.24	6.44	4.80	6.06	5.18
MW-201	10.66	5.85	4.81	NM	-
MW-21	12.12	6.83	5.29	6.98	5.14
MW-22	11.89	6.78	5.11	6.72	5.17
MW-23	10.92	6.20	4.72	5.71	5.21
MW-24	10.61	5.88	4.73	5.44	5.17
MW-25	11.28	6.00	5.28	6.20	5.08
MW-26	11.99	6.77	5.22	7.11	4.88
MW-27	11.63	6.61	5.02	6.64	4.99
MW-28	11.17	6.18	4.99	6.32	4.85
MW-29	10.63	5.83	4.80	5.94	4.69
MW-30	10.41	5.60	4.81	5.60	4.81
MW-31D	10.70	NI	_	NM	-

Top of casing and groundwater elevations are relative to an arbitrary reference elevation designated at the site.

Notes: NI = not installed.

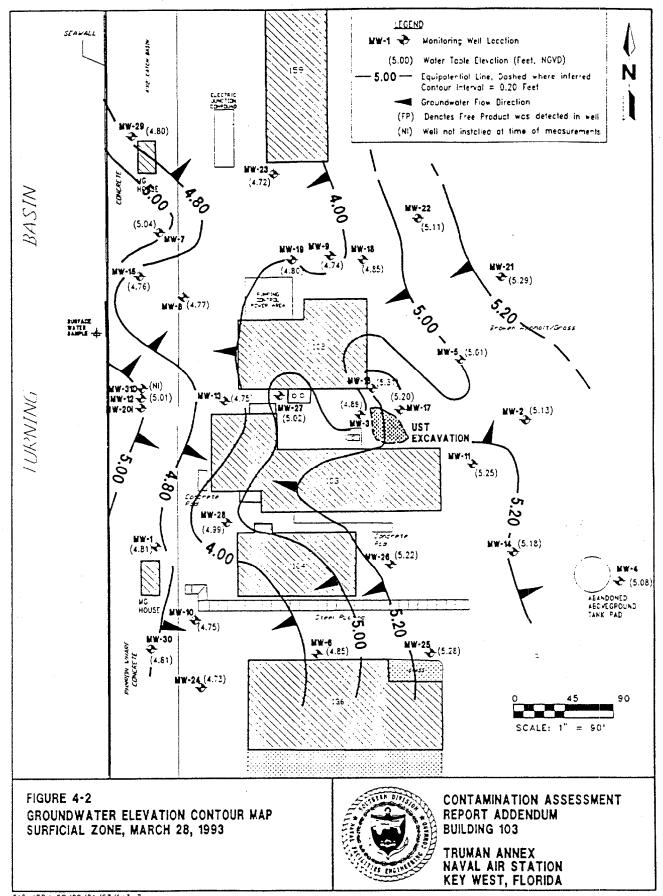
NM = not measured.

bls = below land surface.

- = not calculated.

bis = below land surface.

²1.29 feet of free product was discovered in MW-14 at a depth of 6.59 feet below land surface.



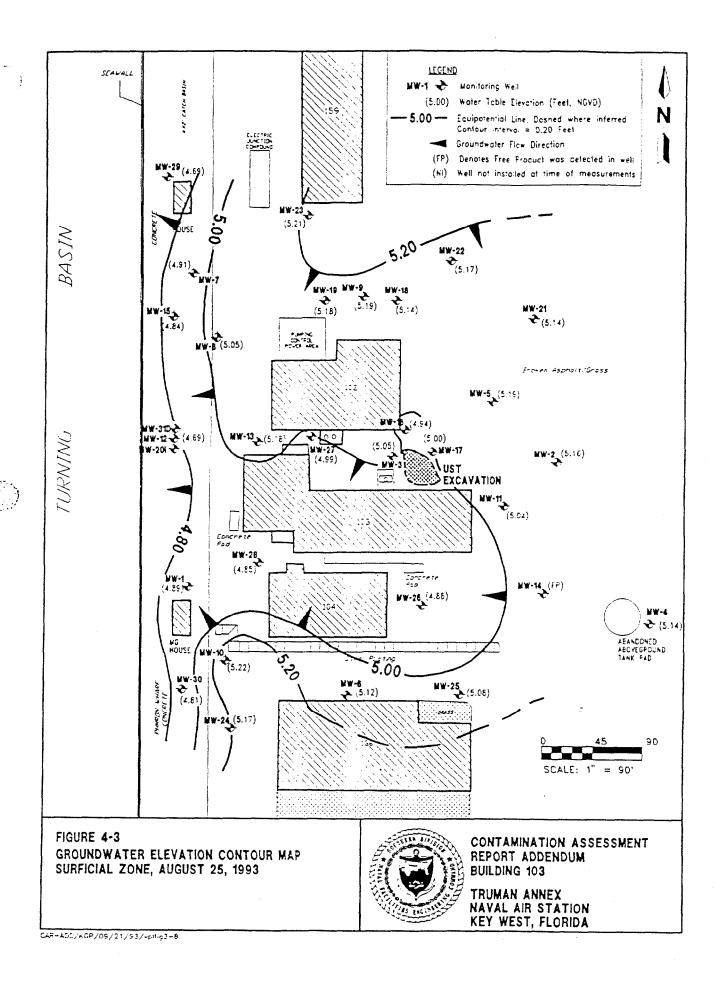


Table 4-5 Summary of Groundwater Sample Laboratory Analytical Results

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

Compound	State Target Level for Recommended Guidance Concentration	MW -1	DUP -2 ¹	MW -2	MW -3	MW -4	MW -5	MW -6	MW -7	MW -8	DUP -3 ¹	MW -9	MW -11	MW -12	MW -13
Benzene	11	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total VOA	²200	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	1	ND	15	ND
Total PAH	'10	ND	ND	ND	39	ND	ИD	ND	ND	9	ND	ND	ND	910	ND
Total naphthalenes	²100	ND	ND	ND	286	ND	ND	ND	ND	43	35	ND	ND	520	ND
Arsenic	4 50	ND	ND	ND	ND	ND	ND	16	ND	ND	ND	ND	ND	ND	ND
Barium	41000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110
Cadmium	4 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	450	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	⁴ 50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	230
Selenium	1 10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ND	ND	ND
TRPH	²5	1	ND	2	28	ND	6	ND	12	3	7	27	t	16	18
Methyl tert-butyl ether	²50	4	4	ND	ND	3	2	5	ND	4	7	ND	ND	ND	ND

Table 4-5 (Continued) Summary of Groundwater Sample Laboratory Analytical Results

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

Compound	State Target Level for Recommended . Guidance Concentration	MW -14	MW -15	MW -16	MW -17	MW -18	MW -20l	MW -23	MW -25	DUP -11	MW -26	MW -27	MW -28	MW -30
Benzene	21	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	4	ND
Total VOA	200	11	ND	ND	ND	ND	19	42	ND	ND	ND	4	326	ND
Total PAH	³10	ND	ИD	ND	ND	ND	340	ND	ND	ND	6	280	710	ND
Total naphthalenes	²100	430	ND	ND	ND	ND	408	ND	ND	ND	ND	860	3250	ND
Arsenic	4 50	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Barium	41000	ND	ND	120	120	ND	ИD	ND	ND	120	ND	150	ND	ND
Cadmium	410	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND
Chromium	4 50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	77	ND	ND
Mercury	4 2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	ND	ND
Lead	⁴ 50	7	ND	ND	ND	ND	ND	ND	ND	33	13	1200	ND	ND
Methyl tert-butyl ether	²50	ND	ND	ND	ND	ND	ND.	ND	ND	4	ND	ND	ND	2
1,2-Dichloroethane (total)	³ 3	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	³700	ND	ND	33	15	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide		ND	ND	4	3	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRPH	, ³ 5	600	61	7	4	3	2	ND	1	1	2	240	7	ND

¹Duplicate sample 1 was taken from MW-25, duplicate sample 2 was taken from MW-1, and duplicate sample 3 was taken from MW-8.

Notes: All concentrations are in parts per billion, except TRPH which is in parts per million.

ND = not detected.

Total VOA = total volatile organic aromatics; the sum of benzene, ethylbenzene, toluene, and xylenes.

Total PAH = the sum of polynuclear aromatic hydrocarbons, excluding total naphthalenes.

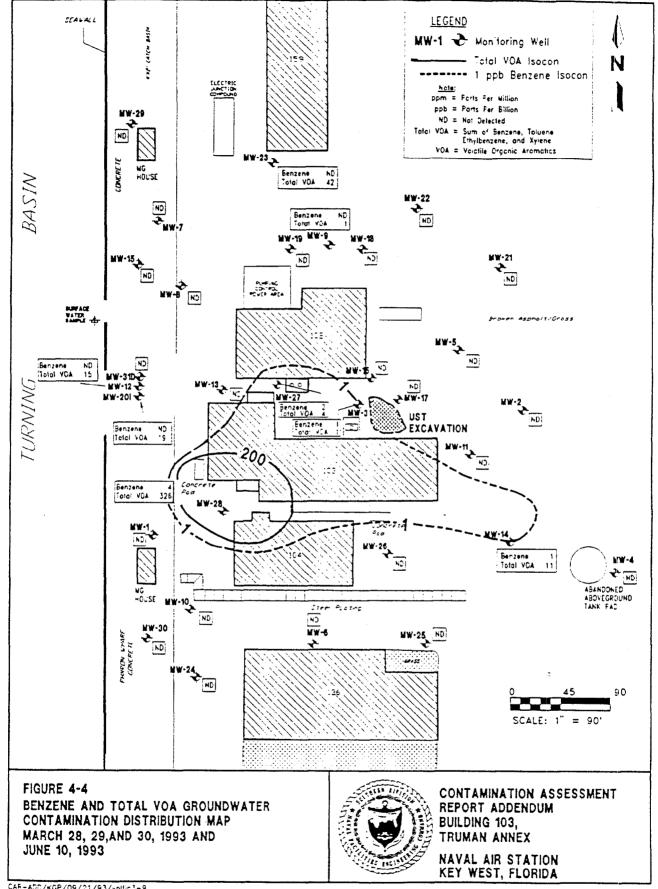
Total naphthalenes = the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

TRPH = total recoverable petroleum hydrocarbons.

²State target level (Chapter 17-770, Florida Administrative Code [FAC]).

Guidance Concentration (Florida Department of Environmental Regulation [FDER], February 1989).

⁴Primary Drinking Water Standard, Chapter 17-550, FAC.



State Class G-III groundwater target levels is centered around monitoring well MW-28 and appears to be restricted to this vicinity.

4.2.2.2 Polynuclear Aromatic Hydrocarbons (PAHs) and Total Naphthalene PAHs detected in groundwater samples include acenaphthene, anthracene, fluoranthene, fluorene, phenanthrene, and pyrene. PAHs were detected in the samples collected from monitoring wells MW-3, MW-8, MW-12, MW-20I, MW-26, MW-27, and MW-28 at concentrations of 39 ppb, 9 ppb, 910 ppb, 340 ppb, 6 ppb, 280 ppb, and 710 ppb, respectively.

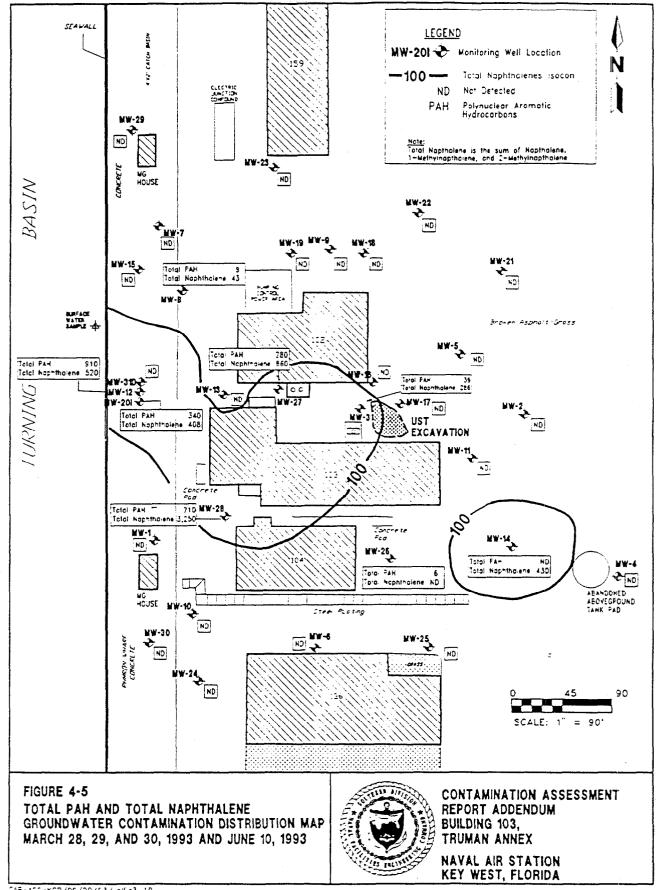
Total naphthalene is the sum concentration of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. It was detected in groundwater samples collected from monitoring wells MW-3, MW-8, MW-12, MW-14, MW-20I, MW-27, and MW-28 at concentrations of 286 ppb, 43 ppb, 520 ppb, 430 ppb, 408 ppb, 860 ppb, and 3,250 ppb, respectively.

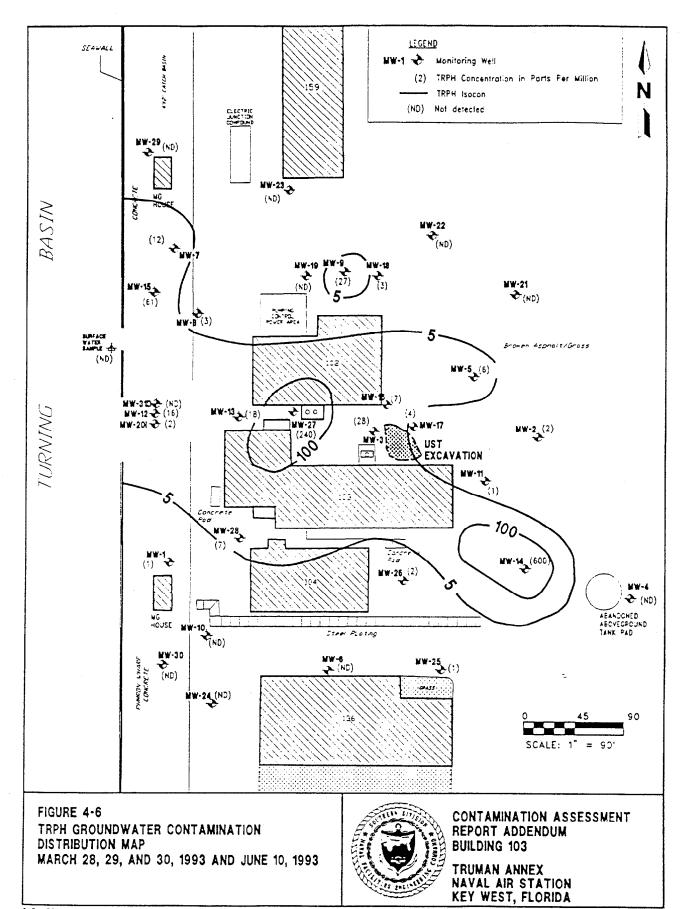
As of 1993, FDEP has established no target levels for PAH or total naphthalenes (FDER, 1990) in Class G-III groundwater. Contamination associated with PAH and total naphthalenes will be assessed based on site-specific conditions.

There are two separate areas with elevated concentrations of total naphthalenes and PAH in the groundwater (Figure 4-5). One area is in the vicinity of monitoring well MW-14 in the western part of the site near an abandoned aboveground tank pad. Groundwater contamination in this area can be correlated with excessive soil contamination (Figure 4-1). The second area is much larger and near the east wall of Building 103 (Figure 4-5). The northern, southern, and western boundaries of this plume abut the seawall in the vicinity of monitoring well MW-12.

Concentrations of total naphthalene and PAH in the groundwater decrease with depth below the top of the water table in the vicinity of monitoring well MW-12. Total naphthalene and PAH concentrations in the sample collected from shallow monitoring well MW-12 were 520 ppb and 910 ppb, respectively, compared to respective concentrations of 408 ppb and 242 ppb in monitoring well MW-20I, the intermediate depth well, which is screened from 27 to 32 feet bls. No contamination was detected in the sample collected from deep monitoring well MW-31D, which is screened from 50 to 55 feet bls. These results indicate the vertical extent of total naphthalene and PAH contamination is less than 50 feet bls.

4.2.2.3 Total Recoverable Petroleum Hydrocarbon (TRPH) Concentrations of TRPH were detected in the samples collected from monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-11 through MW-18, MW-20I, and MW-25 through MW-28 (Figure 4-6). Concentrations of TRPH were detected above the Class G-III groundwater State target level for perimeter monitoring wells of 5 ppm (FDER 1990) in the samples collected from perimeter monitoring wells MW-5, MW-7 through MW-9, MW-12, MW-13, MW-15, MW-16, MW-27, and MW-28. The highest TRPH concentration detected in a perimeter monitoring well sample was 240 ppm from MW-27. Of the three source monitoring wells (MW-3, MW-14, and MW-17) only the concentration of 600 ppm detected in the sample from MW-14 exceeded the Class G-III groundwater target level of 100 ppm for source monitoring wells. The high TRPH concentrations in the sample collected from MW-14 coincides with excessive soil contamination found in this area.





4.2.2.4 Metals Concentrations of metals detected in groundwater samples from site monitoring wells include arsenic, barium, cadmium, chromium, mercury, lead, and selenium (Figure 4-7). FDEP has not established Class G-III groundwater target cleanup levels for barium, mercury, or selenium.

Arsenic was detected in groundwater samples collected from monitoring wells MW-6 and MW-14 at concentrations of 16 ppb and 15 ppb, respectively. These concentrations are well below the Class G-III groundwater target level of 50 ppb for perimeter wells.

Barium was detected in groundwater samples collected from monitoring wells MW-13, MW-16, MW-17, and MW-27 at concentrations of 110 ppb, 120 ppb, 120 ppb, and 150 ppb.

Cadmium, chromium, and mercury were detected in the groundwater sample collected from monitoring well MW-27. The cadmium concentration of 12 ppb exceeds the Class G-III target cleanup level of 5 ppb for perimeter wells. The chromium concentration of 77 ppb exceeds the target cleanup level of 50 ppb. Mercury was detected at a concentration of 2 ppb.

Lead was detected in samples collected from monitoring wells MW-13, MW-14, MW-26, MW-27 and the duplicate sample from monitoring well MW-25. Lead concentrations exceeded Class G-III groundwater target level for perimeter monitoring wells of 50 ppb in groundwater samples collected from monitoring wells MW-13 (240 ppb) and MW-27 (1200 ppb). The concentrations of lead detected in MW-14 (7 ppb) and the duplicate sample collected from MW-25 (33 ppb) were below the target level.

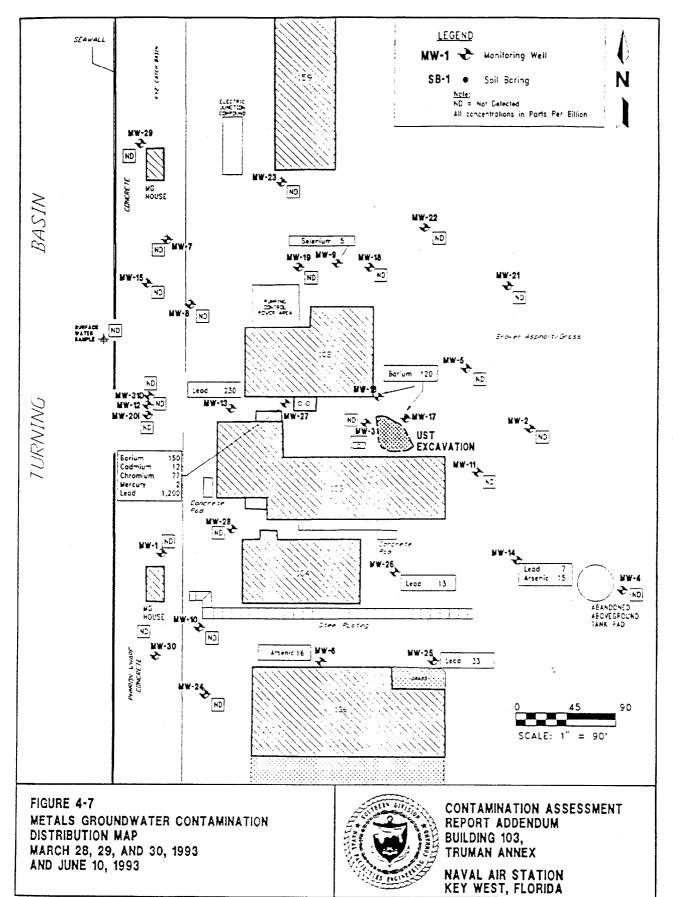
Selenium was detected in the groundwater sample collected from monitoring well MW-9 at a concentration of $5~\rm ppb$.

4.2.2.5 Other Petroleum Compounds MTBE was detected in the samples collected from monitoring wells MW-1, MW-4, MW-5, MW-6, MW-8, and MW-30. The highest concentration (7 ppb) was detected in the duplicate sample collected from monitoring well MW-8. FDEP has not established Class G-III groundwater target cleanup levels for MTBE.

The compound 1,2-dichloroethane was detected in the groundwater sample collected from monitoring well MW-16 at a concentration of 1 ppb. There is no established target cleanup level for 1,2-dichloroethane.

Carbon disulfide was detected in groundwater samples collected from monitoring wells MW-16 and MW-17 at concentrations of 4 ppb and 3 ppb, respectively.

4.2.2.6 Tentatively Identified Compounds (TICs) A total of 42 TICs were detected in groundwater samples collected from shallow monitoring wells MW-3, MW-12, MW-16, and MW-17. TICs include substituted cyclohexanes, trimethyloctanes, dimethylnonane, substituted decanes and dodecanes, substituted long-chained hydrocarbons, substituted benzenes, naphthalene and substituted naphthalenes, indanes, indenes, substituted ethanone, lenthionine, tetrathiepane, and sulfur. Unidentified compounds were detected in the samples collected from monitoring wells MW-16 and MW-17. Most of these compounds appear to be petroleum-related products, which may be derived from kerosene constituents.



Estimated concentrations of the TICs are reported in Table 4-6. The total estimated concentration of TICs varies from 91 ppb, in the sample collected from monitoring well MW-17, to 1,003 ppb in the sample collected from monitoring well MW-3.

TICs were not detected in deep monitoring well MW-31D adjacent to monitoring well MW-12.

- 4.2.2.7 Free Product Contamination Free product was not observed in any site monitoring wells during the investigation conducted in 1991, 1992, or 1993. However, 1.29 feet of free product was detected in monitoring well MW-14 during the August 25, 1993, groundwater level measurement event. The presence of free product is associated with excessively contaminated soil in this area (Figure 4-1). Analytical results of samples from monitoring wells MW-4, MW-25, MW-26, MW-11 and MW-2 located in the vicinity of MW-14 indicate that the extent of free product does not extend outside the area of excessive soil contamination, which has been assessed by OVA headspace analyses.
- 4.2.2.8 Comparison of August 1991, April 1992, and March 1993 Groundwater Analytical Data Monitoring wells MW-1 through MW-11 were sampled in August 1991. In April 1992 monitoring wells MW-12 through MW-15 were sampled and monitoring wells MW-3, MW-4, and MW-8 were resampled. PAH, total naphthalene, and TRPH groundwater concentrations in August 1991 and April 1992 laboratory results were compared to those of March 1993. These data indicate groundwater contaminant levels have decreased in many of the monitoring wells during this time. These data are summarized in Table 4-7.

The March 1993 analytical data indicate that PAH concentrations at the site have generally decreased with time. The most significant decrease of PAH concentrations was observed in the samples collected from MW-12, which decreased from 1,950 ppb to 910 ppb. A slight increase in PAH concentrations from 34 ppb to 39 ppb was observed in monitoring well MW-4.

Total naphthalene concentrations have significantly decreased for each respective well. The most significant decrease was observed in the samples collected from monitoring well MW-12, in which total naphthalene concentrations decreased from 2,530 ppb to 520 ppb.

TRPH concentrations decreased in groundwater samples collected from monitoring wells MW-1, MW-2, MW-5, MW-8, MW-9, MW-10, and MW-11. The most significant decrease was observed for the sample collected from monitoring well MW-10, in which TRPH concentrations decreased from 38 ppm to less than 1 ppm (not detected). TRPH increased in the samples collected from monitoring wells MW-3, MW-7, MW-13, MW-14, and MW-15. The most significant increase in TRPH concentration was observed in the sample collected from monitoring well MW-14, in which TRPH increased from 110 ppm to 600 ppm (1.29 feet of free product was detected in this well in August 1993). TRPH concentrations in the groundwater sample collected from monitoring well MW-12 were 16 ppm for both sampling events.

4.2.2.9 Vertical Extent of Groundwater Contamination Because monitoring well MW-12 is located in the total naphthalene and TRPH plumes (Figures 4-5 and 4-6, respectively), two vertical extent wells were installed adjacent to monitoring well MW-12 to assess the vertical extent of groundwater contamination in this area. Monitoring well MW-12 is screened from 3 to 13 feet bls, monitoring well

Table 4-6 Summary of Tentatively Identified Compounds (TICs) in Groundwater Samples, March 28 through 30, 1993

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

Tentatively Identified Compound	MW-3	MW-12	MW-16	MW-1
Benzene, propyl	25	ND	6	ND
Benzene, 2-propenyl	ND	ND	11	ND
Benzene, (1-methylethyl)	ND	ND	16	ND
Benzene, 1-Methyl-2-(1-methylethyl)	11	ND	7	ND
Benzene, 1-Methyl-3-(1-methylethyl)	23	ND	ND	ND
Benzene, Methyl-4-(1-methylethyl)	20	ND	8	ND
Benzene, 2.4-Dimethyl-1-(1-methylethyl)	30	ND	6	ND
Benzene, 1,2,4,5-Tetramethyl	33	ND	12	ND
Benzene, 1,3-Diethyl	14	ND	ND	ND
1,1-Biphenyl, 4-methyl	ND	57	ND	ND
Cyclohexane, (1-Methylpropyl)	21	ND	ND	ND
Cyclohexane, octyl	40	ND	ND	ND
Decane, 3,6-dimethyl	ND	ND	ND	13
Dodecane, 2.6,10-trimethyl	80	ND	ND	ND
Dodecane, 2,6,11-trimethyl	ND	ND	ND	8
Dodecane, 2.7,10-trimethyl	59	ND	ND	16
Ethanone, 1-(3-nitrophenyl)	ND	ND	ND	7
1-H-indene, 2,3-dihydro-1,2-dimethyl	ND	ND	ND	6
1-H-indene, octahydro-2,2,4,4,7,7-hexamethyl-, trans	ND	31	28	7
5-H-indeno [1,2-b] pyridine	ND	21	ND	ND
Heptadecane, 2,6,10,14-tetramethyl	ND	ND	33	ND
7-Hexadecyne	20	ND	ND	ND
Indane	50	22	ND	ND
ndane, 1-methyl ·	ND	9	ND	DN
ndene, 2,3-dihydro-1-methyl	ND	ND	. 6	ND
Lenthionine	ND	62	ND	ND
Naphthalene	ND	ND	280	5
Naphthalene, 1-methyl	ND	ND	31	8
Naphthalene, 1,8-dimethyl	ND	ND	11	ND

Table 4-6 (Continued) Summary of Tentatively Identified Compounds (TICs) in Groundwater Samples, March 28 through 30, 1993

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

Tentatively Identified Compound	MW-3	MW-12	MW-16	MW-17
Naphthalene, 1,2-dimethyl	48	ND	ND	ND
Naphthalene, 1,3-dimethyl	ND	ND	ND	14
Naphthalene, 1,6-dimethyl	ND	21	ND	ND
Naphthalene, 1,7-dimethyl	160	26	ND	ND
Naphthalene, 1,6,7-trimethyl	46	ND	ND	ND
Naphthalene, 1,4,6-trimethyl	53	ND	ND	ND
Naphthalene, 1-(2-propenyl)	ND	36	ND	ND
Nonane, 2.6-dimethyl	81	ND	ND	ND
Octane, 2.3,6-trimethyl	22	ND	ND	ND
Octane, 2.3.7-trimethyl	ND	ND	25	ND
Pentadecane, 2.6.10.14-tetramethyl	110	21	40	ND
Sulfur, mol.	ND	21	ND	ND
1,2,4,6-Tetrathiepane	ND	220	ND	ND
Unknowns, total	ND	ND	46	7
Total Concentration of TICs:	946	547	566	91

Notes: Concentrations are estimated and reported in parts per billion. $ND = not \ detected$.

Table 4-7 Comparison of Total PAH, Total Naphthalenes, and TRPH Concentrations, August 1991, April 1992, and March 1993

Contamination Assessment Report Addendum Site 103. Truman Annex Key West, Florida

		PAH		Tota	l Naphthale	nes		TRPH	
Well Designation	8/91	4/92	3/93	8/91	4/92	3/93	8/91	4/92	3/93
MW-1	ND	-	ND	ND	-	ND	3	-	1
MW-2	ND	-	ND	ND	-	ND	3	-	2
MW-3	34	37	39	368	309	286	24	21	28
MW-4	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5	ND		ND	ND	-	ND	8		6
MW-6	ND	-	ND	ND	-	ND	ND	· _	סא
MW-7	ND	-	ND	DИ	-	ND	7	-	12
MW-8	ND	15	9	77	ND	43	90	50	7
MW-9	ND	-	ND	ND		ND	46		27
MW-10	ND	-	ND	СИ	-	ND	38	-	ND
MW-11	ND		ND	ND	-	ND	2		1
MW-12	-	1950	910	-	2530	520		16	16
MW-13	_	ND	ND	-	ND	ND		7	18
MW-14	_	ND	ND	_	660	430		110	600
MW-15		20	ND	-	ND	ND	-	49	61

Notes: Concentrations are in parts per billion (ppb).

ND = not detected.

Spaces in which no value appears indicate that the monitoring well was not sampled at that time.

MW-20I is screened from 27 to 32 feet bls, and monitoring well MW-31D is screened from 50 to 55 feet bls.

Concentrations of total VOA, PAH, total naphthalene, and TRPH were 15 ppb, 910 ppb, 520 ppb, and 16 ppm, respectively, in the groundwater sample collected from monitoring well MW-12 in March 1993. Groundwater analyses of samples collected from the two vertical extent wells indicate that groundwater contamination decreases with depth. These data are summarized in Table 4-8. PAH, total naphthalene, and TRPH concentrations were lower in the sample collected from monitoring well MW-20I than the respective concentrations in the sample collected from monitoring well MW-12. Total VOA concentrations, however, were slightly higher. No contamination was detected in monitoring well MW-31D. The groundwater data indicate that the vertical extent of groundwater contamination does not extend deeper than 50 feet bls.

4.3 SURFACE WATER ASSESSMENT RESULTS. The surface water sample collected on the seaward side of the seawall, between monitoring wells MW-12 and MW-15, was analyzed for used oil parameters. Contamination was not detected in this sample (see Figures 4-5 through 4-7).

Table 4-8

Comparison of Groundwater Contaminants Detected in Monitoring Wells KYW-103-MW-12, KYW-103-MW-20I, and KYW-103-MW-31D

Contamination Assessment Report Addendum Site 103, Truman Annex Key West, Florida

			Cor	ncentration	
Well Designation	Screened Interval (feet)	Total VOA	PAH	Total Naphthalenes	TRPH
MW-12	3 to 13	15	910	520	16
MW-20I	27 to 32	19	340	408	2
MW-31D	50 to 55	ND	ND	ND	ND

Notes: Concentrations are reported in parts per billion, except for TRPH, which is reported in parts per million.

Total volatile organic aromatics (VOA) are the sum of benzene, ethylbenzene, toluene, and xylenes.

Polynuclear aromatic hydrocarbons (PAH) excluding naphthalenes.

Total naphthalenes are the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

TRPH = total recoverable petroleum hydrocarbons.

ND = not detected.

5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

- 5.1 SUMMARY AND CONCLUSIONS. Based upon the results of soil, sediment, groundwater, and surface water samples collected during the investigations conducted from August 1991 to August 1993, the following is a summary of the conditions observed at Site 103.
- 5.1.1 Soil Assessment Results of OVA headspace analysis indicate excessive soil contamination at the site in three isolated areas. One area is located in the vicinity of monitoring well MW-14, a second area is in the vicinity of the former waste oil UST, and a third area is along the western side of Building 102 (Figure 4-1).

TRPH analytical results indicate petroleum contamination is present in sediments collected along the seawall adjacent to the turning basin on the west side of the site. The extent of TRPH contamination in the sediments has not been delineated to the north; however, a sediment sample taken from the turning basin at a nearby site (approximately 300 feet north of SB-74) also contained high levels of TRPH (ABB-ES, 1993). This indicates the background levels of TRPH in the turning basin sediments may exceed State target levels. Additionally, the TRPH concentrations detected in sediment samples collected along the seawall do not correspond with the direction of groundwater contamination migration or areas of soil contamination at the site. High TRPH concentrations were detected in areas where no groundwater contamination was detected. For example, the highest TRPH soil concentration was detected in the sample collected from soil boring SB-74, which is located directly west of monitoring well MW-30, in which no groundwater contaminants were detected. It is likely that the source of TRPH in the turning basin sediments is the result of previous naval activities and are not related to petroleum contamination at Site 103. Furthermore, the concrete seawall extends to a depth of 53 feet bls, inhibiting petroleum migration into the turning basin sediments.

5.1.2 Groundwater Assessment Groundwater flow direction in the surficial aquifer is tidally influenced, occasionally resulting in fluctuations in groundwater flow direction; however, the predominant general groundwater flow direction at the site appears to be toward the west. There are no known potable wells in the Key West area (McKenzie, 1990). The surficial aquifer in the Key West area is classified as a G-III (non-potable) groundwater source.

Free petroleum product was detected in monitoring well MW-14 on August 25, 1993. The estimated areal extent of free product contamination is restricted to a small area of the site in the vicinity of an abandoned storage tank pad. The area of excessively contaminated soil in the vicinity of monitoring well MW-14 roughly corresponds to the extent of free product (Figure 4-1).

Total VOA, TRPH, lead, chromium, and cadmium concentrations exceed applicable State target levels in groundwater samples collected at the site. In addition, elevated concentrations of PAH and total naphthalene were detected in monitoring wells with TRPH concentrations exceeding State target levels for Class G-III groundwater. The areal extent of groundwater contamination exceeding applicable State target levels is shown in Figures 4-4 through 4-7.

The areal extent of total VOA groundwater contamination exceeding the State Class G-III groundwater target level of 200 ppb is restricted to the vicinity of monitoring well MW-28.

The areal extent of TRPH groundwater contamination exceeding the State target level of 5 ppm for Class G-III groundwater is larger than the other areas of contamination. TRPH contamination extends from the vicinity of monitoring well MW-14 west to the seawall. The highest TRPH concentrations were detected in groundwater samples collected from monitoring wells MW-14 and MW-27.

Although there are no State target levels for PAH or total naphthalene in Class G-III groundwater, results of groundwater laboratory analysis indicate areas where PAH and total naphthalene concentrations exceed 100 ppb. One area where total naphthalene concentrations exceed 100 ppb is in the vicinity of monitoring well MW-14. Another larger area where both PAH and total naphthalene concentrations exceed 100 ppb is in the vicinity of Building 103 in the western section of the site.

Lead concentrations exceed the State target cleanup levels for Class G-III groundwater of 50 ppb (FDEP, 1990) in groundwater samples collected from monitoring wells MW-13 and MW-27, located near the southwest corner of Building 102. Lead was also detected in the groundwater sample collected from monitoring well MW-25 in the southeast section of the site. The concentration of lead detected in the duplicate sample collected from monitoring well MW-25 is below the State target level.

Cadmium and chromium concentrations detected in the groundwater sample collected from MW-27 both exceed the State target cleanup level for Class G-III groundwater. The areal extent of cadmium groundwater contamination, however, is restricted to the vicinity of monitoring well MW-27. Neither cadmium nor chromium were detected in any other groundwater samples.

Comparisons of groundwater analytical results for the period August 1991 to June 1993 indicate groundwater contamination has generally decreased at Site 103.

5.1.3 Potential for Groundwater Contaminant Migration Into the Turning Basin Total VOA and metals contamination appears to be restricted to the site. However, it appears that total naphthalenes (and PAH) and TRPH groundwater contamination is migrating west toward the turning basin. This is shown on Figure 4-1, in which the total naphthalene and TRPH plumes abut the seawall.

There is evidence that indicates the concrete seawall is inhibiting the migration of groundwater contaminants from Site 103 into the turning basin.

- No contamination was detected in the surface water sample collected along the seawall, which is directly downgradient of the total naphthalene and TRPH plume.
- No contamination was detected in monitoring well MW-31D, which is located in the plume and is screened from 50 to 55 feet bls. The seawall extends to a depth of 53 feet bls. Petroleum contamination migrating beneath the seawall into the turning basin would be detected in samples collected from MW-31D.

<u>5.2 RECOMMENDATIONS</u>. Based on the findings and conclusions of this investigation, the following actions are recommended:

Soil and groundwater remediation:

- free product removal and groundwater remediation in the vicinity of monitoring well MW-1/5;/-
- soil remediation in the areas of excessive soil contamination;
- groundwater remediation in the vicinity of monitoring well MW-27;
- groundwater remediation in the vicinity of the former waste oil UST, near monitoring well MW-3;

The manner of soil and groundwater remediation will be presented in a remedial action plan (RAP), which will be developed pending acceptance of this CAR.

Groundwater monitoring:

- semiannual groundwater monitoring of total VOA concentrations in monitoring wells MW-1, MW-12, MW-27, and MW-28 for a period of 2 years;
- semiannual groundwater monitoring of total naphthalenes and PAH concentrations in monitoring wells MW-1, MW-8, MW-12, MW-20I, MW-27, and MW-28 for a period of 2 years;
- semiannual groundwater monitoring of TRPH concentrations in monitoring wells MW-1, MW-4, MW-5, MW-7, MW-14, MW-26, and MW-27, for a period of 2 years; and
- semiannual groundwater monitoring of lead concentrations in monitoring wells MW-13, MW-25, MW-26, and MW-27 for a period of 2 years.

If contaminant levels drop below State target levels at the end of the monitoring period, a No Further Action Proposal (NFAP) will be submitted. If contaminant levels persist above State target levels, then additional monitoring or remediation may be required.

6.0 PROFESSIONAL REVIEW CERTIFICATION

This report was prepared using sound hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the CAR and in the text and appended to this report. If conditions are revealed that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This CAR Addendum was developed for the site near Building 103 at the Electric Power Plant, Truman Annex, NAS Key West, Key West, Florida, and should not be construed to apply to any other site.

Michael J. Williams Professional Geologist P.G. No. 344

Date

Tru_103.CAR MVL.09.93

REFERENCES

- ABB Environmental Services, Inc., 1992, Contamination Assessment Report, Electric Power Plant, Building 103, Truman Annex, Naval Air Station, Key West, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.
- Florida Department of Environmental Regulation, October 1990, No further action and monitoring only guidelines for petroleum contaminated sites: Division of Waste Management, 6 p.
- Florida Department of Environmental Regulation, May 1992, Guidelines for assessment and remediation of petroleum contaminated soils: Division of Waste Management, 39 p.
- McKenzie, D.J., 1990, Water resources potential of the freshwater lens at Key West, Florida: U.S. Geological Survey Water Resources Investigations Report 90-4115, 24 p.

APPENDIX A FDEP CORRESPONDENCE AND MEETING MINUTES

State of Florida DEPARTMENT OF ENVIRONMENTAL REGULATION

	For Routing To Other Thad	The Addresse
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Interoffice Memorandum

TO:

Eric S. Nuzie, Federal Facilities Coordinator Bureau of Waste Cleanup

THROUGH: Dr. James J. Crane, PGIII/Administrator

Technical Review Section

FROM:

Jorge R. Caspary, P.G. Base Coordinator

JRC

Technical Review Section

DATE:

August 31, 1992

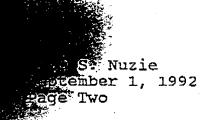
SUBJECT:

Review of Contamination Assessment Report (CAR) Electric Power Plant

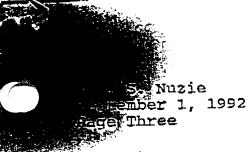
Building 103. Truman Annex. Naval Air Station Key West.

The Bureau of Waste Cleanup has reviewed the Contamination Assessment Report (CAR) dated June 1992, 1992 (received , 1992), submitted for this site. In order to meet the requirements of Chapter 17-770, Florida Administrative Code (F.A.C.), the following comments need to be addressed:

- 1) .- Supplemental soil assessment in accordance with Rule 17-770.200(2), F.A.C., and the Department's May 1992 "Guidelines for Assessment and Remediation of Petroleum Contaminated Soils" should be performed around the former excavated UST area to further establish the horizontal and vertical extent of soil contamination in the unsaturated The OVA values should be summarized in a table, and the approximate extent of soil contamination should be represented in graphic form.
- 2) .- Documentation (field observations and measurements, volumes, shipping manifest, sampling/analysis results, etc.) regarding the soil Initial Remedial Action (IRA) that was performed should be provided. This documentation should include a map showing the approximate limits of the excavation and the locations of the soil samples, along with a table with the OVA readings used to determine the extent of contaminated soil.



- 3).- Five additional, permanent monitoring wells should be installed as follows to define the horizontal and vertical extent of the groundwater contamination:
 - a. Four water table wells located in the center of the excavated UST area; 25 feet North of the UST area, and 25 feet East and West of KYW 103-9; and
 - b. An intermediate depth well next to MW-KYW103-12, screened about 20 to 25 feet below land surface, to define the horizontal extent of the plume in that stratum of the aquifer.
- 4).- After installation of the supplemental monitoring wells, the following simultaneous sampling event should be conducted [including blanks and a duplicate sample], so that this review can be completed and a Remedial Action Plan (RAP) can be prepared based on current data (additional monitoring wells should be installed and sampled if significant contaminant concentrations are detected at perimeter monitoring wells of any affected stratum or at the vertical extent well:
 - a. Wells KYW103-12 and the well requested in the center of the former UST area should be sampled and analyzed for EPA Methods 624, 625, 418.1, and priority Total Metals; and
 - b. All the remaining wells including the ones to be installed should be sampled and analyzed for EPA Methods 602 (including MTBE), 610, 418.1, and priority Total Metals.
- 5).- Surface water and sediment samples between monitoring wells MW-12 and MW-15 should be sampled and analyzed for used oil compounds.
- 6).— Laboratory results of the TRPH analysis in groundwater conducted in April and August of this year should be verified and validated by the ABB-ES Quality Assurance Officer.
- 7).- Please provide the construction details of the monitoring well existing prior to the assessment effort.



Please provide the results of the supplemental assessment to the Technical Review Section within sixty (60) days of receipt of this request. If additional time is needed, a time extension request should be submitted, in accordance with Rule 17-770.800(6), F.A.C. If there are any questions concerning this review, please contact Jorge R. Caspary at (904) 488-0190.

Please note, all supplemental contamination assessment related documents should be signed and sealed by a registered professional in accordance with Rule 17-770.500, F.A.C. The certification should be made by a registered professional who is able to demonstrate competence in the subject area(s) addressed within the sealed document.



An ABB

Environmental

Services, Inc.

ASFA BROWN BOVERI MEMORANDUM

MARCH 10, 1993

TO: Carl Loop

Code: 1847

EIC SouthDiv NAVFACENGCOM

FROM: Jack Pittman

PROJECT: CTO 7, NAS Key West

SUBJECT: Meeting at FDER

REFERENCES:

- 1. FDER Interoffice Memorandum, August 31, 1992, Subject: Review of Contamination report Electric Power Plant, Building 103, Truman Annex, Naval Air Station Key West.
- 2. Our August 20, 1992 Actual Incurred Costs and Estimate-to-Complete CTO#007 - Contamination Assessment.

BACKGROUND:

The CTO 7 Estimate-to-Complete proposed funding for supplemental field investigations requested by FDER in response to the Contamination Assessment Report. FDER's request was formalized in Reference 2. Contract Mod 000702 providing an additional \$80,327 for the supplemental work was received on or about Jan 29.

PURPOSE OF MEETING:

In reviewing the Estimate-to-Complete prepared last August, we became concerned that FDER's guidance on contamination assessment field investigations had evolved from focus on identification of sources to plume boundaries. We requested a meeting with FDER to obtain a higher degree of confidence that the supplemental field work that we were preparing to initiate would complete our investigation efforts.

DISCUSSIONS:

Today Roger Durham, the CTO 7 Field Operations Leader, and I met with Jorge Caspary at FDER to the scope of the supplemental field discuss investigation.

Mr. Durham provided an overview of previous field

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- R. Durham
- S. McDuffie/File

investigation results at the CTO 7 Truman Annex sites. Mr. Caspary discussed his evaluation of the contamination plumes at these sites as merging into one plume and generally moving toward the turning basin. He noted that the eastern and western boundaries of the contamination plume were not well delineated by the past investigation and stated that, "it would be in the best interest of the Navy to delineate the contamination boundaries". Mr. Caspary stated that temporary wells with sand packs would suffice as boundary delineation wells.

Mr. Caspary also related ongoing concerns that USEPA has about the risk of impacting sea life from petroleum leaks and spills at coastal sites. FDER is now requesting routine sampling and analysis of coastal sediments and surface waters at coastal site like CTO 7. If contamination is detected in the sediments or surface waters, FDER may request preparation of a risk assessment to be included with the contamination assessment report.

FOLLOW-ON ACTIONS:

We are currently scoping a minimum number of temporary monitoring wells and assessing the cost of their installation versus the budget provided in Contract Mod. 000702. We also are committed to avoiding a delay in the start of the CTO 7 supplemental field program during the week of March 22.

We are evaluating several alternative course of action depending on the cost of the additional wells:

- Complete the installation and sampling of wells and borings, delay preparation of the CAR Addendum, pending approval of an Estimate-to-Complete proposal for additional funding.
- ► Install wells and borings, delay sampling pending approval of an Estimate-to-Complete proposal for additional funding. Sampling could be accomplished coincidental with new NAS Key West projects.

We will provide you with a definitive recommendation by Friday.



DATE: May 26, 15,3

TO: Mr. Luis Vazquez

Code: 1843 Mr. Carl Loop Code: 1847

Southern Division

NAVFACENGCOM

FROM: Jack Pittman

ABB-ES UST Department

PROJECTS: CTO 7, NAS Key West

SUBJECT: FDER Coordination Meeting

BACKGROUND: The analytical results of the latest supplemental field investigations conducted during the week of March 31, 1993 at NAS Key West CTO 7 sites indicated a need for further contamination plume delineation at Truman Annex Site 103, the Power Plant, and Site 189, the Berthing Wharf.

> Field investigation results and approaches for completing investigations at both sites were evaluated at an ABB-ES/SouthDiv conference on May 19, 1993.

PURPOSE OF MEETING:

To review the results of the field investigations at NAS Key West Sites 103 and 189 and approaches for plume delineation to obtain FDER comments on finalizing contamination assessments at these sites.

(In addition, at the request of FDER, an overview of NADEP, Pensacola Site 3810N was presented. The results of these discussions were provided in separate correspondence to Mr. Vazquez)

ATTENDEES:

FDER: Tim Bahr

SouthDiv Carl Loop

Jorge Caspary

David Clowes Michael Deliz

ABB-ES K. Busen

R. Durham

Tim Larson

J. Pittman

DISCUSSIONS: Site 103. The March 31 field investigation delineated the horizontal boundaries of the 5 ppm TRPH contamination plume at Site 103. A deep well (MW-20D), screened between 27 and 32 feet was found to contain concentrations of 2 ppm of TRPH and 320 ppb of PAH and 408 ppb of total napthalenes. (See Figure 1 attached). According to Navy drawings, the old sea wall, extends to a depth of 23 feet below land surface (bls) of the site. Groundwater contamination was found below the depth of the old sea wall indicating that the old sea wall may not form an effective barrier to contamination migration.

According to Navy drawings, the new sea wall that immediately abuts the Atlantic Ocean was constructed to a depth of 53 feet. ABB-ES has recommended that a second deep well be installed and screened to a depth interval of 50 to 55 feet to assess the potential for migration of contamination under the new sea wall to ocean waters. Because of the density of utilities between the old and new sea walls and the difficulty in locating them, the new deep well will most likely have to be installed on the landward side of the old sea wall.

ABB-ES will also collect sediment samples for analysis as close to the seaward side of the new sea wall as feasible.

FDER representatives had no significant comments on pursuing this approach.

Site 189. This site is adjacent to Site 103 and is similarly bounded by the old and new sea walls and the Atlantic Ocean. The results of groundwater analysis from the March 31, 1993 field investigation indicated an increase in TRPH concentrations to 300 ppm in groundwater in MW KYW 189-3 on the western side of the site. (See Figure 2). MW KYW 189-1, located on the eastern side of the site, was found to contain free product during the initial field investigation; but no free product was found in this well during the March 31 field investigation. However, the results of groundwater analysis did indicate TRPH concentrations at 57 ppm.

ABB-ES is recommending the installation of one well to assess the vertical extent of the contamination and two additional shallow wells to assess the horizontal extent of contamination in the vicinity of MW KYW 189-3.

ABB-ES will also collect sediment samples for analysis as close to the seaward side of the new sea wall as feasible. FDER representatives stated that surface water samples were not needed at this site.

Mr. Loop raised the issue of remediation alternatives at Site 189 - considering the non-volatile nature of the contamination.

FDER representatives provided the following comments and requests for additional data for completing the contamination assessment and developing remediation alternatives at this site:

- ▶ Resample all site monitoring wells for TRPH.
- ▶ Collect samples for bioremediation.
- ► Consider removal of contaminated soils as part of remediation alternatives.

APPENDIX B SOIL ANALYTICAL DATA

KYW-103-SB-63

5910 Breckenridge Parkway, Suite H 313-621-0734 Tampa, Fu 33610 F4X 313-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER 1-08-134

TASK ORDER NUMBER 0019

TRUMAN ANNEX BLDG 103

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES
5910 BRECKENRIDGE PARKWAY, SUITE H
TAMPA, FLORIDA 33610
(813) 621-0784

Project Manager

Randall C. Grubbs
Laboratory Director - Florida

April 22, 1993



INVOLVEMENT

This report summarizes the analytical results of the Truman Annex Bldg 103 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 31 March 1993, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER METHOD

ORGANICS

Volatile Organics			Method Method		
Ethylene Dibromide	**	EPA	Method	601	Mod.
Base/Neutral Acid Extractables	**	EPA	Method	625	
Polynuclear Aromatic Hydrocarbons	**	EPA	Method	625	

METALS

Arsenic	**	EPA	Method	206.2
Barium	**	EPA	Method	200.7
Cadmium	**	EPA	Method	200.7
Chromium	**	EPA	Method	200.7
Lead	**	EPA	Method	239.2

Continued - Page 2

NOTE:	** Indicates usage of this method to obtain results for this report.
(D)	Indicates draft version of this method was used
EPA Methods	Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods	From 40CFR Part 136, published in Federal Register on October 26, 1984.
SW846 Methods	Test Methods for Evaluating Solid Waste Physical/Chemical

Methods, 3rd Edition, USEPA, 1986.

ASTM Methods American Society for Testing and Materials.

NIOSH Method NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER

METHOD

Page 2 - Continued

METALS

Mercury Selenium Silver

** EPA Method 245.1 ** EPA Method 270.2 ** EPA Method 200.7

MISCELLANEOUS

Tot. Rec. Petroleum Hydrocarbons

** EPA Method 418.1

NOTE:

** Indicates usage of this method to obtain results for this report.

(D)

Indicates draft version of this method was used

EPA Methods

Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-

79-020, March, 1983. July, 1982

Drinking Waters USEPA, 600/4-88/039, December, 1988.

Std. Methods

Standard Methods for the Examination of Water and Waste-water,

APHA, 16th edition, 1985.

USEPA Methods

From 40CFR Part 136, published in Federal Register on October

SW846 Methods

26, 1984. Test Methods for Evaluating Solid Waste Physical/Chemical

Methods, 3rd Edition, USEPA, 1986.

ASTM Methods

NIOSH Method

American Society for Testing and Materials. NIOSH Manual of Analytical Methods, National Institute Occupational Safety and Health, 2nd Edition, April 1977.



LAB #: 3C3011-29

MATRIX: SOIL

DATE RECEIVED: 3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 7/93

SAMPLE ID: KYW-103-SB63

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

USEPA METHOD 8240 - GC/MS

DRY WEIGHT (%): 88

Acetone Benzene Bromodichloromethane	ND** ND ND	<pre>cis-1,3-Dichloropropene trans-1,3-dichloropropene Ethylbenzene</pre>	ND ND ND
Bromoform Bromomethane 2-Butanone	ND ND* ND**	2-Hexanone Methylene chloride 4-Methyl-2-pentanone	ND** ND
Carbon disulfide Carbon tetrachloride Chlorobenzene	ND ND ND	Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND ND
Chlorodibromomethane Chloroethane Chloroform	ND ND* ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	ND ND
Chloromethane 1,1-Dichloroethane 1,2-Dichloroethane	ND* ND ND	Trichloroethene Vinyl chloride Xylene(Total)	ND ND*
1,1-Dichloroethene 1,2-Dichloroethene(Total) 1,2-Dichloropropane	ND ND ND		

NOTE:	ND	(None Detected, lower detectable limit = 5 ug/kg) dry weig	ſ
	ND*	(None Detected, lower detectable limit = 10 ug/kg) dry weig	ĺ
	ND**	(None Detected, lower detectable limit = 50 ug/kg) dry weig	}
	J	(Detected, but below quantitation limit; estimated value)	
	В	(Compound detected in method blank associated with this sample)	
		(Not Analyzed)	

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	TOM TEAET
1,2-Dichloroethane	95	(75-123)	(85-126)	(85-138)
Toluene-d8	100	(92-107)	(89-124) '	(89-128)
Bromofluorobenzene	98	(86-115)	(84-124)	(83-128)



LAB #: 3C3011-29

MATRIX: SOIL

DATE RECEIVED: DATE EXTRACTED:

3/30/93 3/31/93

DATE ANALYZED:

4/19/93

SAMPLE ID: KYW-103-SB63

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL EXTRACTABLE ORGANICS

USEPA METHOD 8270 - GC/MS

(1 of 2)

DRY WEIGHT (%): 88

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo (b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:	ND	(None Detected,	lower detectable limit	= 0.59	mg/kg) dry weight
	ND*	(None Detected,	lower detectable limit	= 3.0	mg/kg) dry weight
	.T	(Detected but	helow quantitation limit	· estimated	value)

В (Compound detected in method blank associated with this sample)

⁽Not Analyzed)



LAB #: 3C3011-29

MATRIX: SOIL

DATE RECEIVED: DATE EXTRACTED:

3/30/93 3/31/93

DATE ANALYZED:

4/19/93

SAMPLE ID: KYW-103-SB63

2,4,6-Tribromophenol

KEY WEST-CTO 7

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 8270 - GC/MS

DRY WEIGHT (%): 88

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND *
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 0.59 (None Detected, lower detectable limit = 3.0 mg/kg) dry weight NOTE: ND ND* mg/kg) dry weight (Detected, but below quantitation limit; estimated value) J (Compound detected in method blank associated with this sample) (Not Analyzed)

(10-134)

(10-156)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
2-Fluorophenol	60	(17-95)	(24-118)
Phenol-d5	87	(11-89)	(17 - 124)

38



LAB #: 3C3011-29

MATRIX: SOIL

DATE RECEIVED: 3/30/93

DATE EXTRACTED: 3/31/93

DATE ANALYZED:

4/19/93

SAMPLE ID: KYW-103-SB63

KEY WEST-CTO 7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1.2.4-Trichlorobenzene	ND

(None Detected, lower detectable limit = 0.59 NOTE: ND mg/kg) dry weight (None Detected, lower detectable limit = 3.0 mg/kg) dry weight ND*

J (Detected, but below quantitation limit: estimated value)

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER SOLID	
Nitrobenzene-d5	74	(22-135) (10-155)	
Fluorobiphenyl	76	(34-140) (12-153)	ļ
Terphenyl-d14	75	(10-132) (13-140)	



DATE RECEIVED:

3/30/93

LAB #: 3C3011-29

SAMPLE ID: KYW-103-SB63

DATE EXTRACTED:
DATE ANALYZED:

3/31/93 4/19/93

HRS84297

MATRIX: SOIL

SOIL

KEY WEST-CTO 7

CERTIFICATION #: E84059

EXTRACTABLE ORGANICS
OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS

with their estimated concentrations

Decanal

0.24 mg/kg



DATE RECEIVED: 3/30/93

LAB #: 3C3011-29 MATRIX : SOIL

SAMPLE ID : KYW-103-SB63

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - dry weight basis

DRY WEIGHT (%): 88

ELEMENT	PREPARATION - ANALYSIS DATE	DETECTION LIMIT		
Silver	3/31- 4/ 5/93	ND	2.5	mg/kg
Arsenic	3/31/93	ND	0.5	mg/kg
Barium	3/31- 4/ 5/93	9.7	5.0	mg/kg
Cadmium	3/31- 4/ 5/93	ND	0.5	mg/kg
Chromium	3/31- 4/ 5/93	9.4	2.5	mg/kg
Mercury	4/ 1/93	ND	0.2	mg/kg
Lead	3/31- 4/ 5/93	16	2.5	me ≀
Selenium	3/31- 4/ 1/93	ND	0.25	mg/kg



LAB #: 3C3011-29 MATRIX : SOIL

SAMPLE ID : KYW-103-SB63

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION resul't PARAMETER ANALYSIS DATE LIMIT 37 Tot Recoverable Pet Hydrocarbons 4/13/93 5 mg/kg



QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles Toluene 2-Butanone Acetone

Semi-volatiles Methylene chloride Dimethyl phthalate Diethly phthalate Di-n-butyl phthalate Butyl benzyl phthalate Bis (2-ethylhexyl) phthalate

Magnesium Sodium

Metals

Calcium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT Benzene	0 10	95 86	112 93	16 8	22 20	66-119 39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		cep. method

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

- J indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).
- B indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.
- DIL indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



LAB #: 3C3011-BK

MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED:

CERTIFICATION #: E84059

NA

DATE ANALYZED:

4/ 5/93

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS

METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 ND NOTE:

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

100

(73 - 131)



LAB #: 3C3011-BK MATRIX: WATER

DATE RECEIVED: 3/30/95
DATE EXTRACTED: NA

DATE ANALYZED:

4/ 5/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS METHOD 602 - GC

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

% 102 ACCEPTABLE LIMITS (73-131)



LAB #: 3C3011-BK

DATE RECEIVED: DATE EXTRACTED: 3/30/93

MATRIX: WATER

DATE ANALYZED:

NA 4/ 6/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ug/L) as rec'd

ug/L) as rec'd

VOLATILE ORGANICS METHOD 602 - GC

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 ND NOTE:

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

94

(73 - 131)



LAB #: 3C3011-BK MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED: NA DATE ANALYZED: 4/ 7/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ug/L) as rec'd

ug/L) as rec'd

VOLATILE ORGANICS METHOD 602 - GC

ND
ND
ИD
ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: 100 Trifluorotoluene (PID) (73 - 131)



LAB #: 3C3011-BK

MATRIX: SOIL

DATE RECEIVED: 3/30/93 NA

DATE EXTRACTED: DATE ANALYZED: 4/6/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

VOLATILE ORGANICS

USEPA METHOD 8240 - GC/MS

	Acetone	ND**	cis-1,3-Dichloropropene	ND
	Benzene	ND	trans-1,3-dichloropropene	ND
	Bromodichloromethane	ND	Ethylbenzene	ND
	Bromoform	ND	2-Hexanone	ND**
	Bromomethane	ND*	Methylene chloride	ND
	2-Butanone	ND**	4-Methyl-2-pentanone	ND**
	Carbon disulfide	ND	Styrene	ND
	Carbon tetrachloride	ND	1,1,2,2-Tetrachloroethane	ND
`	Chlorobenzene	ND	Tetrachloroethene	ND
	Chlorodibromomethane	ND	Toluene	ND
	Chloroethane	ND*	. 1,1,1-Trichloroethane	ND
	Chloroform	ND	1,1,2-Trichloroethane	ND
	Chloromethane	ND*	Trichloroethene	ND
	1,1-Dichloroethane	ND	Vinyl chloride	ND*
	1,2-Dichloroethane	ND	Xylene (Total)	ND
	1,1-Dichloroethene	ND		
	1,2-Dichloroethene (Total)	ND		
	1,2-Dichloropropane	ND		

NOTE:	ND	(None Detected, lower detectable limit = 5 ug/kg) as rec'c
	ND*	(None Detected, lower detectable limit = 10 ug/kg) as rec'c
	ND**	(None Detected, lower detectable limit = 50 ug/kg) as rec'c
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)

•		
		-
	(Not Analyzed)	(Not Analyzed)

ACCEPTABLE LIMITS	
water solid	TOM TEAET
(75-123) (85-126)	(85-138)
(92-107) (89-124)	'(89-128)
(86~115) (84-124)	(83-128)
	(75-123) (85-126) (92-107) (89-124)



LAB #: 3C3011-BK

DATE RECEIVED: 3/30/93 DATE EXTRACTED:

3/31/93 4/14/93

HRS84297

MATRIX: WATER

DATE ANALYZED:

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

ND (None Detected, lower detectable limit = 5 ug/L) as rec'd NOTE: (None Detected, lower detectable limit = ND* ug/L) as rec'd (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		water solid	
Nitrobenzene-d5	123	(22-135) (10-155)	
Fluorobiphenyl	89	(34-140) (12-153)	
Terphenyl-d14	88	(10-132) (13-140)	



DATE RECEIVED:

3/30/93

LAB #: 3C3011-BK

DATE EXTRACTED: 4/ 1/93

MATRIX: WATER

DATE ANALYZED:

4/17/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

ND
ND

NOTE:		(None Detected,							rec'd
	ND*	(None Detected,	Tower	detectable	Timic	=	ug/L)	as	rec'd
		(Not Analyzed)							

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
75.,		WATER	SOLID	
Nitrobenzene-d5	104	(22-135)	(10-155)	
Fluorobiphenyl	91	(34-140)	(12-153)	٠
Terphenyl-d14	63	(10-132)	(13-140)	



DATE RECEIVED:

3/30/93

LAB #: 3C3011-BK

DATE EXTRACTED:

4/ 1/93

MATRIX: WATER

Naphthalene

Pyrene

Phenanthrene

DATE ANALYZED:

4/14/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #:

E84059 HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene ND Acenaphthylene ND Anthracene ND Benzo (a) anthracene ND Benzo (a) pyrene ND Benzo (b) fluoranthene ND Benzo(ghi)perylene ND Benzo(k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND Indeno (1, 2, 3-cd) pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND

NOTE: ND (None Detected, lower detectable limit = 5 ND* (None Detected, lower detectable limit =

ND

ND

ND

ug/L) as rec'd ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY:	8	ACCEPTABLE LIMITS WATER SOLID
Nitrobenzene-d5	105	(22-135) (10-155)
Fluorobiphenyl	92	(34-140) (12-153)
Terphenyl-d14	86	(10-132) (13-140)



LAB #: 3C3011-BK

MATRIX: SOIL

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93

DATE ANALYZED: 4/14

4/14/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 8270 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis (2-Chloroethoxy) methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ИD	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene 4-Chlorophenyl phenyl ether	ND ND	Hexachlorocyclopentadiene Hexachloroethane	ND ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:	ND	(None Detected,	lower detectable	limit =	0.33	mg/kg)	as rec'd
	ND*	(None Detected,	lower detectable	limit =	1.7	mg/kg)	as rec'd
	J	(Detected, but)	below quantitation	limit;	estimated	value)	

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)



LAB #: 3C3011-BK

MATRIX: SOIL

DATE RECEIVED:

3/30/93 3/31/93

DATE EXTRACTED:

DATE ANALYZED:

4/14/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

(None Detected, lower detectable limit = 0.33 NOTE: ND mg/kg) as rec'd (None Detected, lower detectable limit = 1.7 ND* mg/kg) as rec'd J (Detected, but below quantitation limit: estimated value)

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMIT	
		WATER	SOLID
Nitrobenzene-d5	101	(22-135)	(10-155)
Fluorobiphenyl	92	(34-140)	(12-153)
Terphenyl-d14	96	(10-132)	(13-140)



LAB #: 3C3011-BK

MATRIX: SOIL

DATE RECEIVED: DATE EXTRACTED:

3/30/93 3/31/93

DATE ANALYZED:

4/14/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ACID EXTRACTABLE ORGANICS

USEPA METHOD 8270 - GC/MS

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND ND* ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND ND*
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 0.33 (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd ND NOTE: mg/kg) as rec'd ND* (Detected, but below quantitation limit; estimated value) J

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS			
×		WATER	SOLID		
2-Fluorophenol	75	(17-95)	(24-118)	ļ	
Phenol-d5	94	(11-89)	(17-124)		
2,4,6-Tribromophenol	75	(10-134)	(10-156)		



LAB #: 3C3011-BK MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

DRY WEIGHT (%): D

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	3/31- 4/ 5/93	ND	0.05	mg/L
Arsenic	3/31/93	ND	0.01	mg/L
Barium	3/31- 4/ 5/93	ND	0.10	mg/L
Cadmium	3/31- 4/ 5/93	ND	0.01	mg/L
Chromium	3/31- 4/ 5/93	ND	0.05	mg/L
Mercury	4/ 1/93	ND	0.002	mg/L
Lead	3/31- 4/ 5/93	ND	0.05	7
Selenium	3/31- 4/ 1/93	ND	0.005	₽^. ŗ



LAB #: 3C3011-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER ANALYSIS DATE RESULT LIMIT Tot Recoverable Pet Hydrocarbons 4/13- 4/15/93 ND 1 mg/L



LAB #: 3C3011-BK MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	4/13/93	ND	5 mg/kg



LAB #: 3C3011-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/14- 4/15/93	ND	1	mg/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND 1 mg/L



MATRIX : WATER

METHOD: 601/2

RUN ID: SA/SB00824

DATE EXTRACTED: N/A
DATE ANALYZED: 04/05/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Benzene Toluene Chlorobenzene	SA/SB00824	108 111 106	15 70-117 16 70-117 24 58-133
1,1-Dichloroethene		93	28 43-131
Trichloroethene		109	30 69-129
Dichlorobromomethane		106	22 61-133



MATRIX: WATER

METHOD: 601/2

RUN ID: MA/MB01021

DATE EXTRACTED: N/A

DATE ANALYZED: 04/05/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Benzene	MA/MB01021	106	15 70-117	
Toluene	•	108	16 70-117	
Chlorobenzene		101	24 58-133	
1,1-Dichloroethene		122	28 43-131	
Trichloroethene		125	30 69-129	
Dichlorobromomethane		92	22 61-133	-



MATRIX: WATER

METHOD: 602

RUN ID: MA/MB01041

DATE EXTRACTED: N/A

DATE ANALYZED: 04/06/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Benzene	MA/MB01041	110	15 70-117	
Toluene		108	16 70-117	
Chlorobenzene		103	24 58-133	



MATRIX: WATER METHOD: 601/2

RUN ID : SA/SB00860

DATE ANALYZED: 04/07/93

DATE EXTRACTED: N/A

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Benzene	SA/SB00860	114	15 70-117	
Toluene		112	16 70-117	
Chlorobenzene		113	24 58-133	
1,1-Dichloroethene		125	28 43-131	
Trichloroethene		116	30 69-129	
Dichlorobromomethane		125	22 61-133	



LAB ID : 3C3011-1

DATE RECEIVED: 03/30/93

MATRIX: WATER

DATE PREPARED: N/A

METHOD: 602

DATE ANALYZED: 04/06/93

RUN ID : MA/MB01044/01045

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	
Benzene Toluene	MA/MB01044/01045	104 110	110 113	6	15 70-117 16 70-117	
Chlorobenzene		102	104	2	24 58-133	

* = Diluted Out



MATRIX: WATER

METHOD: 601/2

RUN ID: MA/MB01114

DATE EXTRACTED: N/A

DATE ANALYZED: 04/12/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Benzene	MA/MB01114	104	15 70-117	
Toluene		105	16 70-117	
Chlorobenzene		104	24 58-133	
1,1-Dichloroethene	•	101	28 43-131	
Trichloroethene		115	30 69-129	
Dichlorobromomethane		88	22 61-133	



LAB ID: LCS SOLID MATRIX: METHOD: 8240

DATE PREPARED:

04/06/93 04/06/93

DATE ANALYZED:

COMPOUND	LCS %REC	QC LIMITS %RECOVERY
1-1-Dichloroethene	126	56-139
Trichloroethene	102	79-128
Chlorobenzene	104	79-118
Toluene	103	75-121
Benzene	101	66-118



MATRIX: WATER
METHOD: 625
RUN ID: D0275

DATE EXTRACTED: 03/31/93 DATE ANALYZED: 04/14/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Naphthalene 1-Methylnaphthalene	D0275	89 84	43 10-139 48 10-150	
Acenaphthene		88	29 45-130	
Fluorene		91	24 37-133	
Pyrene		109	41 20-144	
Chrysene		86	45 15-152	



LAB ID : LCS MATRIX : WATER

METHOD: 625 RUN ID: D0434 DATE EXTRACTED: 04/01/93 DATE ANALYZED: 04/17/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Naphthalene	D0434	96	43 10-139
1-Methylnaphthalene Acenaphthene		97 98	48 10-150 29 45-130
Fluorene		112	24 37-133
Pyrene		112	41 20-144
Chrysene		93	45 15-152



MATRIX : WATER METHOD : 625 RUN ID : D0291

DATE EXTRACTED: 04/01/93 DATE ANALYZED: 04/15/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Naphthalene	D0291	70	43 10-139
1-Methylnaphthalene		70	48 10-150
Acenaphthene		65	29 45-130
Fluorene		78	24 37-133
Pyrene		71	41 20-144
Chrysene		61	45 15-152



LAB ID : 3C3011-8 MATRIX : WATER

METHOD: 625

RUN ID: D0465/D0494

DATE RECEIVED : 03/30/93 DATE PREPARED : 04/01/93 DATE ANALYZED : 04/18/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	
Naphthalene 1-Methylnaphthalene	D0465/D0494	77 73	72 71	7 3	23 25-97 24 48-101	
Acenaphthene		59	63	7	24 57-104	
Fluorene		64	67	5	28 34-118	
Pyrene Pyrene		50	65	26	30 58-148	
hrvsene		44	54	20	36 48-118	



MATRIX : SOIL

METHOD: 8270 DATE EXTRACTED: 03/31/93 DATE ANALYZED: 04/14/93

RUN ID: D0283

LABORATORY CONTROL SAMPLE RESULTS

	COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
•	1,4-Dichlorobenzene	D0283	80	37 21-98
	N-Nitrosodi-n-propylamine		89	46 41-139
	1,2,4 Trichlorobenzene		89	33 36-104
	Acenaphthene		80	54 22-137
	2,4-Dinitrotoluene		66	45 11-103
	Pyrene		90	49 43-143



LAB ID : LCS
MATRIX : SOIL
METHOD : 8270
RUN ID : D0283

DATE EXTRACTED: 03/31/93 DATE ANALYZED: 04/14/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Phenol 2-Chlorophenol 4-Chloro-3-methylpheno	D0283	73 58 53	28 23-97 45 20-113 34 33-103
4-Nitrophenol Pentachlorophenol	•	118 47	52 15-128 47 17-117



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Antimony	04/08/93	04/12/93	94	21 79-122	LCS
Arsenic (furnace)	04/08/93	04/12/93	106	38 53-131	
Barium	04/08/93	04/12/93	106	19 78-117	
Beryllium	04/08/93	04/12/93	96	18 81-118	
Cadmium	04/08/93	04/12/93	102	18 77-113	, mente
Chromium	04/08/93	04/12/93	106	21 79-121	
Copper	04/08/93	04/12/93	101	19 80-119	
Lead (furnace)	04/08/93	04/12/93	97	33 64-132	
Mercury (vapor)	04/15/93	04/15/93	99	18 83-120	
Nickel	04/08/93	04/12/93	106	13 84-111	
Selenium (furnace)	04/08/93	04/12/93	103	38 54-130	
Silver	04/08/93	04/12/93	99	23 74-121	
Thallium (furnace)	04/08/93	04/09/93	65	31 56-120	
Zinc	04/08/93	04/12/93	103	19 77-116	



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic (furnace)	04/12/93	04/14/93	91	38 53-131	LCS
Barium	04/12/93	04/12/93	104	19 78-117	
Cadmium	04/12/93	04/12/93	101	18 77-113	
Chromium	04/12/93	04/12/93	105	21 79-121	
Lead (furnace)	04/12/93	04/13/93	80	33 64-132	
Mercury (vapor)	04/15/93	04/15/93	99	18 83-120	
Selenium (furnace)	04/12/93	04/13/93	104	38 54-130	
Silver	04/12/93	04/12/93	102	23 74-121	



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic furnace	03/31/93	03/31/93	106	36 51-125	LCS
Barium	03/31/93	04/05/93	93	13 79-106	
Cadmium	03/31/93	04/05/93	94	22 67-113	
Chromium	03/31/93	04/05/93	106	22 73-118	
Lead	03/31/93	04/05/93	88	35 58-130	
Mercury vapor	04/01/93	04/01/93	106	17 82-118	
Selenium furnace	03/31/93	04/01/93	90	32 60-125	
Silver	03/31/93	04/05/93	82	17 71-106	



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	04/14/93		89		LCS
TRPH (IR) TRPH (IR)	04/14/93 04/13/93	• •	90 89	24 75-124 24 75-124	
TRPH (IR)	04/13/93	04/15/93	87	24 75-124	



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	04/13/93	04/13/93	88	30 50-140	LCS



LAB ID : 3C3011-20

DATE RECEIVED: 03/30/93

MATRIX: WATER

DATE PREPARED: N/A

METHOD: 602

RUN ID: MA/MB01056/01057

DATE ANALYZED: 04/07/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Benzene	MA/MB01056/01057	107	113	5	15 70-117
Toluene		108	116	7	16 70-117
Chlorobenzene		97	127	27	24 58-133



LAB ID : 3C3011-23 MATRIX : WATER

METHOD: 625

RUN ID : D0495/D0496

DATE RECEIVED: 03/30/93

DATE PREPARED: 04/01/93 DATE ANALYZED: 04/20/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Naphthalene	D0495/D0496	71	74	4	23 25-97
1-Methylnaphthalene		71	74	4	24 48-101
Acenaphthene		65	66	2	24 57-104
Fluorene		65	71	9	28 34-118
Pyrene		65	72	10	30 58-148
Chrysene		52	58	11	36 48-118



LAB ID : 3C3011-29

MATRIX: SOIL

METHOD : 8270

RUN ID: D0501/D0502

DATE RECEIVED: 03/30/93 DATE PREPARED: 03/31/93

DATE ANALYZED: 04/20/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	
1,4-Dichlorobenzene	D0501/D0502	42	38	10	43 20-132	
N-Nitrosodi-n-propylamine	•	47	44	7	44 25-114	
1,2,4 Trichlorobenzene		36	33	9	24 38-136	
Acenaphthene		41	39	5	22 34-122	
2,4-Dinitrotoluene		33	30	10	41 10-119	
yrene		51	48	6	26 38-141	



LAB ID : 3C3011-29

DATE RECEIVED: 03/30/93 MATRIX : SOIL

DATE PREPARED: 03/31/93 DATE ANALYZED: 04/20/93 METHOD: 8270 RUN ID : D0501/D0502

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol	D0501/D0502	55	49	12	24 15-112
2-Chlorophenol	•	41	37	10	29 19-100
4-Chloro-3-methylphenol		35	32	9	35 29-101
4-Nitrophenol		24	36	40	58 10-147
Pentachlorophenol		21	22	5	39 10-112



LAB ID : 3C3011-10

MATRIX: WATER

DATE RECEIVED : 03/30/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY INORGANIC PARAMETERS - METALS

DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC F	RPD	QC LIMITS RPD %REC	LAB ID
04/08/93	04/12/93	80	91	13	23 73-120	3C3011-1
04/08/93	04/12/93	107	108	1	19 80-119	
04/08/93	04/12/93	102	103	1	15 81-110	
04/08/93	04/12/93	95	95	0	19 79-118	
04/08/93	04/12/93	101	101	0	15 76-110	
04/08/93	04/12/93	99	100	1	21 74-117	
04/08/93	04/12/93	98	98	0	23 79-125	
04/08/93	04/12/93	105	109	4	24 76-124	
04/15/93	04/15/93	74	70	6	22 80-130	
04/12/93	04/12/93	96	97	1	21 72-114	
04/12/93	04/12/93	68	68	0	20 76-116	
04/12/93	04/12/93	91	92	1	16 70-101	
		40	42	5	13 50-102	
04/12/93	04/14/93	98	99	1	16 69-125	
	PREPARED 04/08/93 04/08/93 04/08/93 04/08/93 04/08/93 04/08/93 04/08/93 04/12/93 04/12/93 04/12/93 04/12/93	PREPARED ANALYZED 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/08/93 04/12/93 04/15/93 04/12/93 04/15/93 04/12/93 04/12/93 04/12/93 04/12/93 04/12/93 04/12/93 04/12/93	PREPARED ANALYZED %REC 04/08/93 04/12/93 80 04/08/93 04/12/93 107 04/08/93 04/12/93 102 04/08/93 04/12/93 95 04/08/93 04/12/93 95 04/08/93 04/12/93 99 04/08/93 04/12/93 99 04/08/93 04/12/93 98 04/08/93 04/12/93 74 04/12/93 04/12/93 96 04/12/93 04/12/93 96 04/12/93 04/12/93 91 04/12/93 04/12/93 91	PREPARED ANALYZED %REC %REC F 04/08/93 04/12/93 80 91 04/08/93 04/12/93 107 108 04/08/93 04/12/93 102 103 04/08/93 04/12/93 95 95 04/08/93 04/12/93 101 101 04/08/93 04/12/93 99 100 04/08/93 04/12/93 99 100 04/08/93 04/12/93 98 98 04/08/93 04/12/93 105 109 04/15/93 04/12/93 74 70 04/12/93 04/12/93 96 97 04/12/93 04/12/93 96 97 04/12/93 04/12/93 91 92 04/12/93 04/14/93 40 42	PREPARED ANALYZED	PREPARED ANALYZED %REC %REC RPD RPD %REC 04/08/93 04/12/93 80 91 13 23 73-120 04/08/93 04/12/93 107 108 1 19 80-119 04/08/93 04/12/93 102 103 1 15 81-110 04/08/93 04/12/93 95 95 0 19 79-118 04/08/93 04/12/93 101 101 0 15 76-110 04/08/93 04/12/93 99 100 1 21 74-117 04/08/93 04/12/93 98 98 0 23 79-125 04/08/93 04/12/93 98 98 0 23 79-125 04/08/93 04/12/93 105 109 4 24 76-124 04/15/93 04/15/93 74 70 6 22 80-130 04/12/93 04/12/93 96 97 1

^{* =} Diluted out



LAB ID : 3C3011-26

MATRIX : WATER

DATE RECEIVED : 03/30/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC F	RPD	QC LIMITS RPD %REC	LAB ID
Arsenic (furnace)	04/12/93	04/14/93	86	87	1	19 80-119	3C3011-2
Barium	04/12/93	04/12/93	98	98	0	15 81-110	
Cadmium	04/12/93	04/12/93	90	89	1	15 76-110	
Chromium	04/12/93	04/12/93	94	96	2	21 74-117	m** 1
Lead (furnace)	04/12/93	04/13/93	93	119	25	24 76-124	
Mercury (vapor)	04/15/93	04/15/93	70	82	16	22 80-130	
Selenium (furnace)	04/12/93	04/13/93	60	50	18	20 76-116	
Silver	04/12/93	04/12/93	100	93	7	16 70-101	

^{* =} Diluted out

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

\$ldg 103/ Bldg 129
Client: ABB Project Name/Number: 2013/ Bldg 189
Samples Received By: NAD Date Received: 3-30-93
Sample Evaluation Form By: Cause Mc Multy LAB No: 6661/3630/
Sample Evaluation Form By: (Signature) LAB NO: (DOD) (DOD)
Type of shipping container samples received in? WAL Cooler
Client Cooler WAL Shipper Box Other
Any "NO" responses or discrepancies should be explained in comments section.
YES NO
1. Were custody seals on shipping container(s) intact?
2. Were custody papers properly included with samples?
3. Were custody papers properly filled out (ink, signed, match labels)?
4. Did all bottles arrive in good condition (unbroken)?
5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?
6. Were correct bottles used for the tests indicated?
7. Were proper sample preservation techniques indicated?
8. Were samples received within adequate holding time?
9. Were all VOA bottles checked for the presence of air bubbles? . X
10. Were samples in direct contact with wet ice?
11. Were samples accepted into the laboratory?
Cooler # 322 Temp 8 °C Cooler # DOI Temp 6 °C
Cooler # 59 Temp 8 °C Cooler # 90 Temp 6 °C
103 =°C #313
Comments: #92 4°C *222 10°C
* Metalo Bathle In A322-Dup Rec'd Wolld off + turned over
in Cooler No Sample noton fled 1 Sail Sample for KYWI-103-5: COC Santie 3 126193 to 8270, RCRA. TRP1+

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Samples Received By: Date Received: 3-3/-	CTC7 = ived vols cots received 3109/10/07
Type of shipping container samples received in? WAL Cooler	
Client Cooler WAL Shipper Box Other	
Any "NO" responses or discrepancies should be explained in comments section.	
YES	NO
1. Were custody seals on shipping container(s) intact?	
2. Were custody papers properly included with samples?	
3. Were custody papers properly filled out (ink, signed, match labels)?	
4. Did all bottles arrive in good condition (unbroken)?	
5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	
6. Were correct bottles used for the tests indicated?	
7. Were proper sample preservation techniques indicated?	
8. Were samples received within adequate holding time?	
9. Were all VOA bottles checked for the presence of air bubbles?	
10. Were samples in direct contact with wet ice?	
11. Were samples accepted into the laboratory?	
Cooler # Temp °C Cooler # Temp °C	
Cooler # Temp 4 °C Cooler # Temp 4 °C	
comments: Approximatily half the vials have h	oad space
for each sample and a 462 Jac for	the
USOIL Sample. 3 vous for EB-1	

ADSWORTH/ALERT LABORATORIES Sampling, testing, mobile labs
--

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610 Chain of Cu (813) 621-0784 Fax (813) 623-6021

y Record

(i)

10407

U																						
Client:	128		Project Name / L	1.3.	t		No.		C)	<i>بر</i>					,	,	P	arame	eter		· · · · · · · · · · · · · · · · · · ·	
Sample	(() () (s)			Project #:			1 NO.	/	+-/	3/	-/	-/		- /			' /				. **	
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ltent~	Date	Time	-MATRIX-	Samo	le Location_	سبب ورس		ار ار ار	Hag	METAL			/ ,	-		/	/~ ·	j				
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KYW-103-SB-73

5910 Breckenndge Parkway, Suite H 813-621-0784 Tampa, FL 33610 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-134

TASK ORDER NUMBER: 35

NAS KEY WEST BLDG 103

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES
5910 BRECKENRIDGE PARKWAY, SUITE H
TAMPA, FLORIDA 33610
(813) 621-0784

Joanne Anderson Project Manager

Randall C. Grubbs Laboratory Director - Florida

July 14, 1993

A Corning Company



INVOLVEMENT

This report summarizes the analytical results of the NAS Key West Bldg 103 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 11 June 1993, in accordance with documented sample acceptance procedures. The Total Petroleum Hydrocarbon and Total Organic Carbon analyses were performed by our N. Canton, Ohio facility, Lab #E87225. The Grain Size analysis was performed by Thorton Laboratories, Inc. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD
	1111100

ORGANICS

Volatile Organics Extraction	** EPA Method 624	** SW846 Method 8240 ** SW846 Method 5030
Base/Neutral Acid Extractables Extraction	** EPA Method 625	** SW846 Method 8270 ** SW846 Method 3540
TPH by GC		** SW846 Method 8015 Mod.

METALS

Arsenic	**	EPA Method 206.2 ** SW846 Method	7060
Cadmium	**	EPA Method 200.7 ** SW846 Method	6010

Continued - Page 2

NOTE:

	report.
(D)	Indicates draft version of this method was used
EPA Methods	Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982
Std. Methods	Drinking Waters USEPA, 600/4-88/039, December, 1988. Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.

** Indicates usage of this method to obtain results for this

USEPA Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.

SW846 Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.

ASTM Methods American Society for Testing and Materials.

NIOSH Method NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER

METHOD

Page 2 - Continued

METALS

Chromium Lead

** EPA Method 200.7 ** SW846 Method 6010 ** EPA Method 239.2 ** SW846 Method 7421

Digestion

** SW846 Method 3050

MISCELLANEOUS

Nitrate Nitrogen Ammonia Nitrogen Orthophosphate Total Kjeldhal Nitrogen Total Organic Carbon Tot. Rec. Petroleum Hydrocarbons Extraction

** EPA Method 353.3 ** EPA Method 350.2 ** EPA Method 365.2 ** SW846 Method 351.3 ** SW846 Method 9060 ** SW846 Method 9073 (D) ** SW846 Method 9071

NOTE:

** Indicates usage of this method to obtain results for this report.

(D)

Indicates draft version of this method was used

EPA Methods

Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-

79-020, March, 1983. July, 1982

Drinking Waters USEPA, 600/4-88/039, December, 1988.

Std. Methods

Standard Methods for the Examination of Water and Waste-water,

APHA, 16th edition, 1985.

USEPA Methods

From 40CFR Part 136, published in Federal Register on October

26, 1984.

SW846 Methods

Test Methods for Evaluating Solid Waste Physical/Chemical

Methods, 3rd Edition, USEPA, 1986.

ASTM Methods

American Society for Testing and Materials.

NIOSH Method

NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



DATE RECEIVED:

6/11/93

LAB #: 3F1117-8 MATRIX: SOIL

DATE EXTRACTED: DATE ANALYZED:

NA 6/15/93

SAMPLE ID: SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

USEPA METHOD 8240 - GC/MS

DRY WEIGHT (%): 92

Acetone Benzene Bromodichloromethane	27 ND ND	cis-1,3-Dichloropropene trans-1,3-dichloropropene Ethylbenzene	ND ND 2
Bromoform Bromomethane 2-Butanone	ND ND ND**	2-Hexanone Methylene chloride 4-Methyl-2-pentanone	ND**
Carbon disulfide Carbon tetrachloride Chlorobenzene	ND ND ND	Styrene 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND
Chlorodibromomethane Chloroethane Chloroform	ND ND ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	ND ND
Chloromethane 1,1-Dichloroethane 1,2-Dichloroethane	ND ND ND	Trichloroethene Vinyl chloride Xylene(Total)	ND ND
1,1-Dichloroethene 1,2-Dichloroethene(Total) 1,2-Dichloropropane	ND ND		

NOTE:	ND	(None Detected, lower detectable limit = 2 ug/kg)	dry weig
MOIT		\	
		(1000 2000000) 20000000000000000000000000) dry weig
	ND**) dry weig
	J	(Detected, but below quantitation limit; estimated value)	
	В	(Compound detected in method blank associated with this say	mple)
		(Not Analyzed)	

SURROGATE RECOVERY:	96	ACCEPTABLE LIMITS WATER SOLID	TOM TEAST
1,2-Dichloroethane	125	(78-130) (85-126)	(85-138)
Toluene-d8	103	(90-109) (89-124)	(89-128)
Bromofluorobenzene	107	(81-117) (84-124)	(83-128)



LAB #: 3F1117-8 MATRIX: SOIL

DATE RECEIVED: 6/11/>> DATE EXTRACTED: 6/15/93

DATE ANALYZED:

6/23/93

SAMPLE ID: SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS (1 of 2)

HRS84297

DRY WEIGHT (%): 92

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ИD	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ИD
Bis (2-Chloroethoxy) methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND .	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

Note:	ND*	(None Detected, lower detectable limit = 0.33 mg/kg) dry weight (None Detected, lower detectable limit = 1.7 mg/kg) dry weight
	-	
	J	(Detected, but below quantitation limit; estimated value)

⁽Compound detected in method blank associated with this sample)

⁽Not Analyzed)



DATE RECEIVED: 6/11/93

DATE EXTRACTED: 6/15/93

DATE ANALYZED:

6/23/93

HRS84297

LAB #: 3F1117-8 MATRIX: SOIL

SAMPLE ID: SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

BASE/NEUTRAL FXTRACTABLE ORGANICS
USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone Naphthalene Nitrobenzene	ND ND
N-Nitrosodimethylamine N-Nitrosodiphenylamine N-Nitrosodi-n-propylamine	ND ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	ND ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) dry weight ND* (None Detected, lower detectable limit = 1.7 mg/kg) dry weight J (Detected, but below quantitation limit: estimated value)

B (Compound detected in method blank associated with this sample)

- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	73	(22-135)	(10-155)
Fluorobiphenyl	59	(34-140)	(12-153)
Terphenyl-d14	60	(10-132)	(13-140)



LAB #: 3F1117-8 MATRIX: SOIL

DATE RECEIVED: 6/11/ DATE EXTRACTED: 6/15/93 DATE ANALYZED: 6/23/93

SAMPLE ID: SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS

HRS84297

DRY WEIGHT (%): 92

ND
ND
ND
ND
ND*
ND*
ND
ND*
ND*
ND
ND

(None Detected, lower detectable limit = 0.33 ug/kg) dry we (None Detected, lower detectable limit = 1.7 ug/kg) dry we (Detected, but below quantitation limit; estimated value) (Compound detected in method blank associated with this sample) NOTE: ND ug/kg) dry weight ND* ug/kg) dry weight J B

(Not Analyzed)

SURROGATE RECOVERY:	8	ACCEPTABLE LIMITS
		WATER SOLID
2-Fluorophenol	17	(10-116) (24-118)
Phenol-d6	58	(10-175) (17-124)
2,4,6-Tribromophenol	21	(10-155) (10-156)



LAB #: 3F1117-8

MATRIX: SOIL

DATE RECEIVED:

6/11/93

DATE EXTRACTED: 6/15/93 DATE ANALYZED:

6/23/93

SAMPLE ID: SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

EXTRACTABLE ORGANICS OTHER COMPOUNDS

HRS84297

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

1H-Indene, octahydro-2,2,4,4,7,7-hexamethyl-,trans Benzene,1-(1,3-dimethyl-3-butenyl)-4-fluoro Sulfur,mol.	0.14	mg/kg mg/kg mg/kg
4 Unknowns total	1.0	ma/ka

COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 03/11/93

LAB #: 3F1117-8

MATRIX: SOIL

SAMPLE ID: SB 73 (0-2) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER ANALYSIS DATE RESULT LIMIT Tot Rec Petroleum Hydrocarbons 6/15 - 6/16/93 78 5 mg/kg

NOTE: ND (None Detected)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-8 MATRIX : SOIL

SAMPLE ID : SB 73 (0-2)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - dry weight basis

DRY WEIGHT (%): 92

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	1
Arsenic	6/21/93	0.8	0.5	mg/kg
Cadmium	6/21/93	ND	0.5	mg/kg
Chromium	6/21/93	11	2.5	mg/kg
Lead	6/21/93	ND	2.5	mg/kg

NOTE: ND (None Detected)



LAB #: 3F1117-10 MATRIX: WATER DATE RECEIVED:
DATE EXTRACTED:
DATE ANALYZED:

6/11/. NA 6/14/93

SAMPLE ID: EQUIPMENT BLANK (SOIL)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein ND* 1,1-Dichloroethene ND Acrylonitrile ND* 1,2-Dichloroethene (Total) ND Benzene ND 1,2-Dichloropropane ND Bromodichloromethane ND cis-1,3-Dichloropropene ND Bromoform ND trans-1,3-Dichloropropene ND Bromomethane ND Ethylbenzene ND Carbon tetrachloride ND Methylene chloride ND Chlorobenzene 1,1,2,2-Tetrachloroethane ND ND Chloroethane ND Tetrachloroethene ND ND 2-Chloroethylvinyl ether Toluene ND Chloroform ND 1,1,1-Trichloroethane ND Chloromethane ND 1,1,2-Trichloroethane ND Dibromochloromethane ND Trichloroethene ND 1,2-Dichlorobenzene ND Trichlorofluoromethane ND Vinyl chloride 1,3-Dichlorobenzene ND ND ND 1,4-Dichlorobenzene ND Xylene (Total) 1,1-Dichloroethane ND 1,2-Dichloroethane ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd ND** (None Detected, lower detectable limit = ug/L) as rec'd J (Detected, but below quantitation limit; estimated value)

B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	3
	4	water solid	TOM TEAET
1,2-Dichloroethane	109	(78-130) (85-12)	5) (85-138)
Toluene-d8	98	(78-130) (89-12	(89-128)
Bromofluorobenzene	108	(81-117) (84-12	(83-128)



DATE RECEIVED:

6/11/93

LAB #: 3F1117-10 MATRIX: WATER

DATE EXTRACTED: DATE ANALYZED:

NA 6/14/93

SAMPLE ID: EQUIPMENT BLANK(SOIL) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS OTHER COMPOUNDS

HRS84297

Acetone

Iso-propanol

63 ug/L 550 ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations



LAB #: 3F1117-10

6/11/__ DATE EXTRACTED: 6/14/93

MATRIX: WATER

DATE ANALYZED:

DATE RECEIVED:

6/22/93

SAMPLE ID: EQUIPMENT BLANK (SOIL)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo (b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	, ND	Diethyl phthalate	ND
Benzo (ghi) perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)meth	name ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	: ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)		Fluoranthene	ND
Bis(2-Ethylhexyl)phthal	ate ND	Fluorene	ND
4-Bromophenyl phenyl et		Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
<u>-</u>	ther ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND
• ·			

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)

-- (Not Analyzed)



DATE RECEIVED: 6/11/93 DATE EXTRACTED: 6/14/93

LAB #: 3F1117-10 MATRIX: WATER

DATE ANALYZED:

6/22/93

SAMPLE ID: EQUIPMENT BLANK (SOIL)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL FXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone ND Naphthalene ND Nitrobenzene ND N-Nitrosodimethylamine ND N-Nitrosodiphenylamine ND N-Nitrosodi-n-propylamine ND Phenanthrene ND Pyrene ND 1,2,4-Trichlorobenzene ND

(None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = 50 NOTE: ND ug/L) as rec'd ug/L) as rec'd ND* (Detected, but below quantitation limit: estimated value) J

(Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE WATER	LIMITS SOLID
Nitrobenzene-d5	77	(26-131)	(10-155)
Fluorobiphenyl	72	(27-119)	(12-153)
Terphenyl-d14	93	(10-165)	(13-140)



DATE RECEIVED: LAB #: 3F1117-10

DATE EXTRACTED: 6/14/93 MATRIX: WATER DATE ANALYZED: 6/22/93

SAMPLE ID: EQUIPMENT BLANK (SOIL)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

HRS84297

6/11/5_

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND
2-Methyl-4,6-dinitrophenol	ND
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND*
Phenol 2,4,6-Trichlorophenol	ND ND

NOTE:	ND ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
	- -	(Not Analyzed)

SURROGATE RECOVERY:	* %	ACCEPTABLE LIMI	TS
		Water soli	D.
2-Fluorophenol	62	(10-116) (24-1	18)
Phenol-d6	67	(10-175) (17-1	.24)
2,4,6-Tribromophenol	54	(10-155) (10-1	.56)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-10 MATRIX : WATER

SAMPLE ID : EQUIPMENT BLANK (SOIL) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Arsenic	6/21- 6/22/93	ND	10 ug/I
Cadmium	6/21- 6/22/93	ND	10 ug/L
Chromium	6/21- 6/22/93	ND	50 ug/I
Lead	6/21- 6/22/93	ND	5 ug/I

NOTE: ND (None Detected)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/5

LAB .#: 3F1117-10 MATRIX : WATER

SAMPLE ID : EQUIPMENT BLANK(SOIL) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - ANALYSIS DATE RESULT DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 6/15- 6/16/93 ND 1 mg/L

NOTE: ND (None Detected)



LAB #: 3F1117-11

SAMPLE ID: TRIP BLANK

MATRIX: WATER

DATE RECEIVED: 6/11/93 DATE EXTRACTED:

NA

DATE ANALYZED: 6/14/93

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene(Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
m	ND	cis-1,3-Dichloropropene	ND
Bromodichloromethane			ND
Bromoform	ND	trans-1,3-Dichloropropene	
Bromomethane	ND	Ethylbenzene	ND
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
	ND	Tetrachloroethene	ND
Chloroethane	MD	16C1GCH10106CHCHC	
2-Chloroethylvinyl ether	ND	Toluene	ND
	ND	1,1,1-Trichloroethane	ND
Chloroform		• •	
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
1,3-Dichiolopenzene	110	11171 011101100	
1,4-Dichlorobenzene	ND	Xylene (Total)	ND
1,1-Dichloroethane	ND	-	
1,2-Dichloroethane	ND		
T' 7 DICHTOLOGCHUNG			

NOTE:	ND	(None Detected, lower detectable limit = 1 ug/L) as rec
	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec
	ND**	(None Detected, lower detectable limit = ug/L) as rec
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABL	e Limits	
		WATER	SOLID	TOM TEART
1.2-Dichloroethane	110	(78-130)	(85-126)	(85-138)
Toluene-d8	100	(78-130)	(89-124)	(89-128)
Bromofluorobenzene	106	(81-117)	(84-124)	(83-128)



QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

<u>Volatiles</u> Toluene 2-Butanone Acetone

Semi-volatiles Methylene chloride Dimethyl phthalate Diethly phthalate Di-n-butyl phthalate Butyl benzyl phthalate Bis (2-ethylhexyl) phthalate

<u>Metals</u> Calcium Magnesium Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY (cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT Benzene	0 10	95 86	112 93	16 8	22 20	66-119 39-150
(cmpd. name)	sample result	1st%	2nd%	Rel.%	ac	ccep. method

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

- J indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).
- B indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.
- DIL indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



LAB #: 3F1117-BK

DATE RECEIVED: DATE EXTRACTED: DATE ANALYZED: 6/14/93

6/11/93 NA

MATRIX: WATER

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene(Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene	ND
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
Chloroethane	ND	Tetrachloroethene	ND
2-Chloroethylvinyl ether	NID , ,	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
1,4-Dichlorobenzene	ND	Xylene (Total)	ND
1,1-Dichloroethane	ИD	_	
1,2-Dichloroethane	ND		
-			

NOTE:	ND ND* ND**	(None Detected, lower detectable limit = 10 ug/L) (None Detected, lower detectable limit = ug/L)	as rec'(as rec'(as rec'(
	J	(Detected, but below quantitation limit; estimated value)	
	В	(Compound detected in method blank associated with this samp	le)
		(Not Analyzed)	

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	TOM TEART
1,2-Dichloroethane	111	(78-130)	(85-126)	(85-138)
Toluene-d8	101	(78-130)	(89-124)	(89-128)
Bromofluorobenzene	108	(81-117)	(84-124)	(83-128)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED:

6/11/5

DATE EXTRACTED: DATE ANALYZED:

NA 6/15/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

VOLATILE ORGANICS HRS84297 USEPA METHOD 8240 - GC/MS

Acetone	ND**	cis-1,3-Dichloropropene	ND
Benzene	ND	trans-1,3-dichloropropene	ND
Bromodichloromethane	ND	Ethylbenzene	ND
Bromoform	ND	2-Hexanone	ND**
Bromomethane	ND	Methylene chloride	ND
2-Butanone	ND**	4-Methyl-2-pentanone	ND**
Carbon disulfide	ND	Styrene	ND
Carbon tetrachloride	ND	1,1,2,2-Tetrachloroethane	ND
Chlorobenzene	ND	Tetrachloroethene	ND
Chlorodibromomethane	ND	Toluene	ND
Chloroethane	ND	1,1,1-Trichloroethane	ND
Chloroform	ND	1,1,2-Trichloroethane	ND
Chloromethane	ND	Trichloroethene	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
1,2-Dichloroethane	ND	Xylene (Total)	ND
-,	-1,2	1,2010(10001)	
1,1-Dichloroethene	ND		
1,2-Dichloroethene(Total)	ND		
1,2-Dichloropropane	ND	•	

NOTE:		(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = (None Detected, lower detectable limit = 10	ug/L) a	as rec'd as rec'd as rec'd
	J	(Detected, but below quantitation limit; estimated	value)	
	В	(Compound detected in method blank associated with	this samp!	le)
		(Not Analyzed)	_	

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	TOM TEAET
1,2-Dichloroethane	124	(78-130)	(85-126)	(85-138)
Toluene-d8	107	(90-109)	(89-124)	(89-128)
Bromofluorobenzene	105	(81-117)	(84-124)	(83-128)



LAB #: 3F1117-BK MATRIX: WATER

DATE RECEIVED: 6/11/93 DATE EXTRACTED: 6/14/93

DATE ANALYZED: 6/21/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL -- FXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene Acenaphthylene Anthracene	ND ND ND	Dibenzo(a,h)anthracene Di-n-butyl phthalate 1,2-Dichlorobenzene	ND ND
Benzidine Benzo(a) anthracene Benzo(b) fluoranthene	ND* ND ND	1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine	ND ND*
Benzo(k) fluoranthene Benzo(ghi) perylene Benzo(a) pyrene	ND ND ND	Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene	ND ND
Bis(2-Chloroethoxy)methane Bis(2-Chloroethyl)ether Bis(2-Chloroisopropyl)ether	ND ND	2,6-Dinitrotoluene Di-n-octyl phthalate Fluoranthene	ND ND ND
Bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate	ND ND ND	Fluorene Hexachlorobenzene Hexachlorobutadiene	ND ND ND
2-Chloronaphthalene 4-Chlorophenyl phenyl ether Chrysene	ND ND ND	Hexachlorocyclopentadiene Hexachloroethane Indeno(1,2,3-cd)pyrene	ND ND

B (Compound detected in method blank associated with this sample)	NOTE:	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
· · · · · · · · · · · · · · · · · · ·		J	(Detected, but below quantitation limit; estimated value)
		В,	· · · · · · · · · · · · · · · · · · ·



LAB #: 3F1117-BK MATRIX: WATER

DATE RECEIVED: 6/11/93 DATE EXTRACTED: 6/14/93 DATE ANALYZED: 6/21/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL FXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)
	R	(Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER SOLID		
Nitrobenzene-d5	69	(26-131) (10-155)		
Fluorobiphenyl	62	(27-119) (12-153)		
Terphenyl-d14	78	(10-165) (13-140)		



LAB #: 3F1117-BK MATRIX: WATER

DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/14/93
DATE ANALYZED: 6/21/93

SAMPLE ID: LABORATORY BLANK

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS CERTIFICATION #: E84059 HRS84297

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND ND*
Phenol 2,4,6-Trichlorophenol	ND ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	· %	ACCEPTABLE LIMITS
		water solid
2-Fluorophenol	54	(10-116) (24-118)
Phenol-d6	61	(10-175) (17-124)
2,4,6-Tribromophenol	59	(10-155) (10-156)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED: 6/11, DATE EXTRACTED: 6/15/93 6/22/93

DATE ANALYZED:

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS

(1 of 2)

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND ND	Dibenzo(a,h)anthracene Di-n-butyl phthalate 1,2-Dichlorobenzene	ND ND ND
Benzidine Benzo(a)anthracene Benzo(b)fluoranthene	ND* ND ND	1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine	ND ND*
Benzo(k) fluoranthene Benzo(ghi) perylene Benzo(a) pyrene	ND ND ND	Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene	ND ND ND
Bis (2-Chloroethoxy) methane Bis (2-Chloroethyl) ether Bis (2-Chloroisopropyl) ether	ND , , , , , , , , , , , , , , , , , , ,	2,6-Dinitrotoluene Di-n-octyl phthalate Fluoranthene	ND ND
Bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate	ND ND	Fluorene Hexachlorobenzene Hexachlorobutadiene	ND ND
2-Chloronaphthalene 4-Chlorophenyl phenyl ether Chrysene	ND ND ND	Hexachlorocyclopentadiene Hexachloroethane Indeno(1,2,3-cd)pyrene	ND ND ND

NOTE:	ND ND*	(None Detected, lower detectable limit = 0.33 mg/kg) as rec'd (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)



DATE RECEIVED: 6/11/93
DATE EXTRACTED: 6/15/93

LAB #: 3F1117-BK

DATE EXTRACTED: 6/15/93
DATE ANALYZED: 6/22/93

MATRIX: SOIL

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL FXTRACTABLE ORGANICS

USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd J (Detected, but below quantitation limit: estimated value)

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)

ACCEPTABLE LIMITS SURROGATE RECOVERY: WATER SOLID (22-135)(10-155)91 Nitrobenzene-d5 82 (34-140)(12-153)Fluorobiphenyl (10-132)(13-140)86 Terphenyl-d14



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED:

6/11/ 6/15/93

DATE EXTRACTED:
DATE ANALYZED:

6/22/93

SAMPLE ID: LABORATORY BLANK

ACID EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS

CERTIFICATION #: E84059

HRS84297

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol		ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol		ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol		ND*
Phenol 2,4,6-Trichlorophenol	*	ND ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd J (Detected, but below quantitation limit; estimated value) B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)

ROGATE RECOVERY: % ACCEPTABLE LIMITS

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER SOLID	
2-Fluorophenol	81	(10-116) (24-118)	į
Phenol-d6	89	(10-175) (17-124)	į
2,4,6-Tribromophenol	82	(10-155) (10-156)	ļ



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED:

6/11/93 DATE EXTRACTED: 6/16/93

DATE ANALYZED:

6/18/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

DETECTION

PARAMETER

RESULT (mg/kg)

LIMIT

TPH (Extractable) -GC

ND

10

(None Detected) as rec'd NOTE: ND

(Detected, but below quantitation limit; estimated value) J



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/2

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Arsenic Cadmium Chromium	6/21- 6/22/93 6/21- 6/22/93 6/21- 6/22/93	ND ND ND	10 ug/ 10 ug/ 50 ug/
Lead	6/21- 6/22/93	ND	5 ug/

NOTE: ND (None Detected)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/93

LAB #: 3F1117-BK

MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	6/21/93	ND	0.01	mg/L
Cadmium	6/21/93	ND	0.01	mg/L
Chromium	6/21/93	ND	0.05	mg/L
Lead	6/21/93	ND	0.05	mg/L

NOTE: ND (None Detected)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/5

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION ANALYSIS DATE RESULT PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 6/15-6/16/93 ND 1 mg/L

NOTE: ND (None Detected)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 6/15-6/16/93 ND 1 mg/L

NOTE: ND (None Detected)



DATE RECEIVED: 6/11/95

LAB #: 3F1117-BK MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTI LIMIT	
Ammonia Nitrogen	6/24/93	ND	0.5	mg/L
Nitrate-Nitrite Nitrogen	6/28/93	ND	0.05	mg/L
Phosphate Phosphorus	6/28/93	ND	0.10	mg/L
Total Kjeldahl Nitrogen	6/24/93	ND	0.5	mg/L
Total Organic Carbon	7/ 1/93	ND	50	mg/kg
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ИD	. 5	mg/kg

NOTE: ND (None Detected)

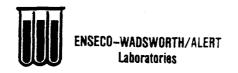


LAB ID : LCS MATRIX : WATER METHOD : 624

RUN ID: FW081

DATE EXTRACTED: N/A
DATE ANALYZED: 06/14/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,1-Dichloroethene Benzene Trichloroethene Dichlorobromomethane Toluene Chlorobenzene	FW081	113 111 113 110 111	41 62-143 19 80-119 18 76-113 29 64-122 18 81-117 19 73-111



LAB ID : LCS MATRIX : SOIL METHOD : 8240 RUN ID : FS108

DATE EXTRACTED: N/A

DATE ANALYZED: 06/15/93

COMPOUND	ANALYTICAL	LCS	QC LIMITS
	RUN ID #	%REC	RPD %REC
1,1-Dichloroethene Benzene Trichloroethene Dichlorobromomethane Toluene Chlorobenzene	FS108	129 115 93 102 110 97	50 52-152 21 78-120 19 73-112 33 57-123 18 80-117 14 75-103



LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : F0364

DATE EXTRACTED: 06/14/93 DATE ANALYZED: 06/21/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,4-Dichlorobenzene	F0364	84	45 19-108
N-Nitrosodi-n-propylamine		90	43 38-123
1,2,4 Trichlorobenzene		69	52 15-119
Acenaphthene		126	42 51-136
2,4-Dinitrotoluene		79	45 26-117
Pyrene		91	55 28-138



MATRIX : WATER

METHOD: 625 RUN ID: F0364

DATE EXTRACTED: 06/14/93 DATE ANALYZED: 06/21/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Pheno1	F0364	70	49 15-112
2-Chlorophenol		69	45 19-109
4-Chloro-3-methylphe	nol	70	47 27-120
4-Nitrophenol		59	54 10-113
Pentachlorophenol		37	47 10-104



MATRIX : SOIL METHOD: 8270

RUN ID : F0388

DATE EXTRACTED: 06/15/93 DATE ANALYZED: 06/22/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,4-Dichlorobenzene N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene Acenaphthene 2,4-Dinitrotoluene	F0388	96 83 79 77 74	42 31-115 52 31-137 47 29-123 57 41-155 52 22-127
Pyrene	*	82	63 15-142



LAB ID : LCS MATRIX: SOIL

8270 METHOD: RUN ID : F0388

DATE EXTRACTED: 06/15/93 DATE ANALYZED: 06/22/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Phenol	F0388	68	44 26-115
2-Chlorophenol		73	53 14-120
4-Chloro-3-methylphen	ol	76	43 35-121
4-Nitrophenol		85	59 16-135
Pentachlorophenol		42	57 10-123



DATE EXTRACTED: 06/16/93 DATE ANALYZED: 06/18/93

LAB ID: LCS
MATRIX: SOLID
METHOD: 8015 Mod.

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND

LCS

QC LIMITS

%REC

%REC

Total Petroleum Hydrocarbons 54

38-120



MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic (furnace) Cadmium Chromium Lead (furnace)	06/21/93	06/22/93 06/22/93 06/22/93 06/22/23	90 103 103 101	24 71-119 17 80-113 20 79-120 28 70-126	LCS



MATRIX : SOIL

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic furnace Cadmium		06/21/93 06/21/93	85 86	22 68-111 18 71-106	LCS
Chromium Lead		06/21/93 06/21/93	93 89	22 71-114 21 72-114	



LAB ID: LCS MATRIX: WATER DATE PREPARED:

07/01/93 07/01/93

DATE ANALYZED:

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	LCS % REC	QC LIMITS & REC
Total Organic Carbon	103	83-120



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	06/15/93 06/15/93		95 94	24 75-123 24 75-123	LCS



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

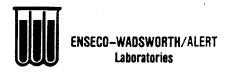
PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Ammonia Nitrogen Total Kjeldahl Nitrogen	06/24/93 06/24/93	06/24/93 06/24/93	104 109	16 86-119 10 92-109	LCS
Phosphate Phosphorus Nitrate Nitrogen	06/28/93 06/28/93	06/28/93 06/28/93	89 100	30 66-126 21 76-119	



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	06/15/93	06/16/93	92	35 56-125	LCS



LAB ID : 3F1117-8

MATRIX : SOIL

METHOD: 8240 RUN ID: FS112/FS113

DATE RECEIVED : 06/11/93 DATE PREPARED : N/A DATE ANALYZED : 06/15/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,1-Dichloroethene Benzene	FS112/FS113	143 118	146 124	2 5	28 60-145 13 87-114
Trichloroethene	•	149	160	7	19 64-103
Toluene		114	120	5	12 85-109
Dichlorobromomethane		97	101	4	21 67-111
Chlorobenzene		103	108	5	21 72-115



LAB ID : 3E1117-1
MATRIX : WATER
METHOD : 625
RUN ID : F0369/F0370

DATE RECEIVED : 06/11/93 DATE PREPARED : 06/14/93 DATE ANALYZED : 06/22/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	
1,4-Dichlorobenzene	F0369/F0370	87	92		20 16-56_	
N-Nitrosodi-n-propylamine		91	93		29 40-127	
1,2,4 Trichlorobenzene		76	81	6	15 27-65_	
Acenaphthene		127	123	3	24 57-104	
2,4-Dinitrotoluene		88	87	1	22 22-81_	
Pyrene		96	97	1	30 58-148	



LAB ID : 3F1117-1 MATRIX : WATER

MATRIX: WATER METHOD: 625

RUN ID: F0369/F0370

DATE RECEIVED: 06
DATE PREPARED: 06

06/11/93 06/14/93

DATE ANALYZED: 06/22/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol 2-Chlorophenol	F0369/F0370	73 73	74 75	1	23 15-97
4-Chloro-3-methylphenol		73 73	74	3 1	21 17-89 36 08-101
4-Nitrophenol Pentachlorophenol		93 48	88 48	6 0	34 13-99 42 13-96



LAB ID : 3F1117-8 MATRIX : SOIL

METHOD: 8270 RUN ID: F0408 DATE RECEIVED: 06/11/93 DATE PREPARED: 06/15/93

DATE ANALYZED: 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	
1,4-Dichlorobenzene	F0408	100 82	110	10	43 20-132 44 25-114	
N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene		87	90	3	24 38-136	
Acenaphthene		120	123	2	22 34-122	
2,4-Dinitrotoluene		79	83	5	41 10-119	
Pyrene		85	89	5	26 38-141	



LAB ID : 3F1117-8 MATRIX : SOIL METHOD : 8270 RUN ID : F0408 DATE RECEIVED: 06/11/93
DATE PREPARED: 06/15/93
DATE ANALYZED: 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol 2-Chlorophenol	F0408	62 58	74 78	18 29	24 15-112 29 19-100
4-Chloro-3-methylphenol		77	79	3	35 29-101
4-Nitrophenol Pentachlorophenol		3 1	39 18	171 179	58 10-147 39 10-112



LAB ID : 3F1117-2 MATRIX: WATER

DATE RECEIVED : 06/11/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE	DATE	MS	MSD	QC LIMITS	LAB
	PREPARED	ANALYZED	%REC	%REC RPD	RPD %REC	ID
TRPH (IR)	06/15/93		115		30 50-140	3F1117-2

* = Diluted out

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Clier	nt: ABB Project Name/Number: Bldg 10 3 3	
Sampl	les Received By: Stylw Date Received: (0-11-93	_
Samp]	le Evaluation Form By: (Signature) (LAB NO: 7141/3F1117	-
Туре	of shipping container samples received in? WAL Cooler	
	Client Cooler WAL Shipper Box Other	
Any "	'NO" responses or discrepancies should be explained in comments section.	
	YES NO	
1.	Were custody seals on shipping container(s) intact?	
2.	Were custody papers properly included with samples?	
3.	Were custody papers properly filled out (ink, signed, match labels)?	
4.	Did all bottles arrive in good condition (unbroken)?	
5.	Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	
6.	Were correct bottles used for the tests indicated?	
7.	Were proper sample preservation techniques indicated?	
8.	Were samples received within adequate holding time?	
9.	Were all VOA bottles checked for the presence of air bubbles?	
	Were samples in direct contact with wet ice?	
	Were samples accepted into the laboratory?	
	Cooler # 891 Temp 8 °C Cooler # 850 Temp 5°C °C	
	Cooler # £30 Temp 3 °C Cooler # A-407 Temp 3 °C	
Comme	nes: COLOR, DO received out of hold time.	

Samoing, testing, mobile labs

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610

Chain of Curtody Record

(813) 621-0784 Fax (813) 623-6021

Record	of	
# 105 (o ^j	

Project Name / Location Parameter 13B-15 MAS KEY WEST No. Sampler(s) Project #: Of BLD4 103 CON-TAINERS Remarks Item Sample Location Date Time MATRIX Scholoso Charger & 615/43 SB70 (3-5) $T_1 \leq s_1 Z_2$ 3916 11.0193 ₹ 2 5012 B76 (8-10) 350 Comme Hans 7.5 3371 (3.5) 3 15192 STIL 1015 1/2 1.2 4 50 C. 3871 (8-10) 1 . 7 7 ١ Programs where 7-3 5 Hotel (01 5377 13-5) 1120501 58 77 (8-10) Ham she sa 73 (1-2) 7 1. 1. 15 7 8 55 13 Washingal BLANKAID 9 11.0 17:5 6 94 6 10 7. Hora 28 8J 31 D 1 1 1 march By make (SUR) 11 100 3 40 117/7 Total **Number of Coolers in Shipment** Bailers Containers Report To: Room Dipham Transfer Item Accepted By / Company Relinquished By / Company Date Time Number(s) Number Additional Comments: 1 110 1 Michigan May Edward Wills in a gard forward I like 2 3 1500 199 - Globas 4 grany 12 5 6

WADSWORTH/ALERT LABORATORIES Sampling, testing, mobile labs

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610

Unain of Custody Record

(813) 621-0784 Fax (813) 623-6021

Record of

10579

Client:	<u> </u>		Project Name / I	_ocation		·····	\neg																	
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Item #	Date	Time	MATRIX	Samı	ole Location	TAINERS	, \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	PAH	METALS	TRPH.	$ED_{B_{-}}$	/	/						* P.		Remarks			``' ~
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APPENDIX C GROUNDWATER AND SURFACE WATER ANALYTICAL DATA

MARCH 28 - 30, 1993 SAMPLING EVENT 5910 Breckenridge Parkway, Suite H 913-621-9784 Tampa, FL 33610

FAX 313-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: 1-08-134

TASK ORDER NUMBER: 0019

TRUMAN ANNEX BLDG 103

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FLORIDA 33610

(813) 621-0784

Joanne Anderson Project Manager

Randall d. Grubbs

Laboratory Director - Florida

April 22, 1993



INVOLVEMENT

This report summarizes the analytical results of the Truman Annex Bldg 103 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 30 March 1993, in accordance with documented sample acceptance procedures. The Volatile 8240 analysis was performed by our N. Canton, Ohio facility, Lab #E87225. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD	
	ORGANICS	
Volatile Organics Extraction	** EPA Method 602	-
Polynuclear Aromatic Hydrocarbons	** EPA Method 625	
Base/Neutral Acid Extractables Extraction	** SW846 Method ** SW846 Method	
	METALS	
Arsenic Barium Cadmium Chromium Lead	** EPA Method 206.2	6010 6010 6010
Continued - Page 2		

NOTE:	** Indicates usage of this method to obtain results for this report.
(D) EPA Methods	Indicates draft version of this method was used Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods	From 40CFR Part 136, published in Federal Register on October 26, 1984.
SW846 Methods	Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
\STM Methods NIOSH Method	American Society for Testing and Materials. NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER METHOD

Page 2 - Continued

METALS

Mercury ** EPA Method 245.1 ** SW846 Method 7470 Selenium ** EPA Method 270.2 ** SW846 Method 7740 Silver ** EPA Method 200.7 ** SW846 Method 6010

Digestion ** SW846 Method 3050

MISCELLANEOUS

Tot. Rec. Pet. Hydrocarbons ** EPA Method 418.1 ** SW846 Method 9073 (D) Extraction ** SW846 Method 9071

NOTE: ** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used

EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-

79-020, March, 1983. July, 1982 Drinking Waters USEPA, 600/4-88/039, December, 1988.

Standard Methods for the Examination of Water and Waste-water, Std. Methods

APHA, 16th edition, 1985.

USEPA Methods From 40CFR Part 136, published in Federal Register on October

26, 1984.

SW846 Methods Test Methods for Evaluating Solid Waste Physical/Chemical

Methods, 3rd Edition, USEPA, 1986.

ASTM Methods

American Society for Testing and Materials.
NIOSH Manual of Analytical Methods, National Institute for NIOSH Method

Occupational Safety and Health, 2nd Edition, April 1977.



LAB #: 3C3011-1 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/30/93 NA

DATE ANALYZED: 4/5/93

HRS84297

ug/L) as rec'd

ug/L) as rec'd

SAMPLE ID: KYW-103-MW1

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene Xylenes Methyl-tert-butylether	ND ND 4

NOTE: ND (None Detected, lower detectable limit = 1

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ૠ SURROGATE RECOVERY: 104 Trifluorotoluene (PID)

ACCEPTABLE LIMITS (73-131)



LAB #: 3C3011-1 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/30/93 3/31/93

DATE ANALYZED:

4/17/93

SAMPLE ID: KYW-103-MW1

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND
-	

(None Detected, lower detectable limit = 6 ND ug/L) as rec'd ug/L) as rec'd NOTE: (None Detected, lower detectable limit = ND* (Not Analyzed)

SURROGATE RECOVERY:

98

82

27

Nitrobenzene-d5

Fluorobiphenyl

Terphenyl-d14

ACCEPTABLE	LIMITS
WATER	SOLID
(22-135)	(10-155)
(34-140)	(12-153)
(10-132)	(13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-1 MATRIX : WATER

SAMPLE ID : KYW-103-MW1

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/L
Arsenic	4/8-4/12/93	ND	10 ug/L
Barium	4/ 8- 4/12/93	ND	100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/ 8- 4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
ead	4/ 8- 4/12/93	ND	5 ug/L
Selenium	4/ 8- 4/12/93	ND	5 ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-1 MATRIX : WATER

SAMPLE ID : KYW-103-MW1

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - ANALYSIS DATE RESULT DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/14- 4/15/93 1 1 mg/L



LAB #: 3C3011-2 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/30/93

DATE ANALYZED:

NA 4/6/93

SAMPLE ID: KYW-103-MW2

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

ug/L) as rec'd

ug/L) as rec'd

METHOD 602 - GC

ND Benzene ND Chlorobenzene 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

SURROGATE RECOVERY: ACCEPTABLE LIMITS 103 (73 - 131)Trifluorotoluene (PID)



LAB #: 3C3011-2 MATRIX: WATER DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93

DATE ANALYZED: 4/17/93

SAMPLE ID: KYW-103-MW2

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo(a)pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	82	(22-135)	(10-155)
Fluorobiphenyl	66	(34-140)	(12-153)
Terphenyl-d14	14	(10-132)	(13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-2 MATRIX : WATER

SAMPLE ID : KYW-103-MW2

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/L
Arsenic	4/8-4/12/93	ND	10 ug/L
Barium	4/ 8- 4/12/93	ND	100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/8-4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
·ead	4/12/93	ND	5 ug/L
Selenium	4/12/93	ND	5 ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-2 MATRIX : WATER

SAMPLE ID : KYW-103-MW2

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION ANALYSIS DATE RESULT PREPARATION -DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 2 1 mg/L



LAB #: 3C3109-1

SAMPLE ID: KYW-103-MW-3

DATE RECEIVED: 3/31/93 DATE EXTRACTED: DATE ANALYZED:

NА 4/10/93

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein Acrylonitrile Benzene	ND* ND* 1	1,1-Dichloroethene 1,2-Dichloroethene(Total) 1,2-Dichloropropane	ND ND
Bromodichloromethane Bromoform Bromomethane	ND ND ND	cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene	ND ND ND
Carbon tetrachloride Chlorobenzene Chloroethane	ND ND ND	Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND
2-Chloroethylvinyl ether Chloroform Chloromethane	ND ND ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	ND ND
Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene	ND ND ND	Trichloroethene Trichlorofluoromethane Vinyl chloride	ND ND
1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane	ND ND ND	Xylene (Total)	ND

NOTE:		(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = 10 (None Detected, lower detectable limit =	ug/L) ug/L) ug/L)	as	rec'd
	J	(Detected, but below quantitation limit; estimated v	alue)		
	В	(Compound detected in method blank associated with t	his sam:	ple	•
		(Not Analyzed)			

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	LOW LEVEL
1.2-Dichloroethane	90	(75-123)	(85-126)	(85-138)
Toluene-d8	103	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	94	(86-115)	(84 - 124)	(83-128)



LAB #: 3C3109-1 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: NA

CERTIFICATION #: E84059

DATE ANALYZED:

4/10/93

HRS84297

SAMPLE ID: KYW-103-MW-3

KEY WEST CTO7

VOLATILE ORGANICS
OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Propyl benzene (1-Methylpropyl) cyclohexane	25 21 11	ug/L ug/L ug/L
1-Methyl-2-(1-methylethyl) benzene	11	ug/11
1,3-Diethyl benzene	14	ug/L
Indane	50	ug/L
1-Methyl-3-(1-methylethyl) benzene	23	ug/L
1-Methyl-4-(1-methylethyl) benzene	20	ug/L
1,2,4,5-Tetramethyl benzene	33	ug/L
7-Hexadecyne	20	ug/L
2,4-Dimethyl-1-(1-methylethyl) benzene	30	ug/L



DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93

HRS84297

LAB #: 3C3109-1

4/21/93 DATE ANALYZED:

MATRIX: WATER

SAMPLE ID: KYW-103-MW-3

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene Acenaphthylene Anthracene	12 ND ND	Dibenzo(a,h)anthracene Di-n-butyl phthalate 1,2-Dichlorobenzene	ND ND
Benzidine Benzo(a)anthracene Benzo(b)fluoranthene	ND* ND ND	1,3-Dichlorobenzene 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine	ND ND*
Benzo(k) fluoranthene Benzo(ghi) perylene Benzo(a) pyrene	ND ND ND	Diethyl phthalate Dimethyl phthalate 2,4-Dinitrotoluene	ND ND
Bis (2-Chloroethoxy) methane Bis (2-Chloroethyl) ether Bis (2-Chloroisopropyl) ether	ND ND ND	2,6-Dinitrotoluene Di-n-octyl phthalate Fluoranthene	ND ND ND
Bis(2-Ethylhexyl)phthalate 4-Bromophenyl phenyl ether Butyl benzyl phthalate	ND ND	Fluorene Hexachlorobenzene Hexachlorobutadiene	15 ND ND
2-Chloronaphthalene 4-Chlorophenyl phenyl ether Chrysene	ND ND ND	Hexachlorocyclopentadiene Hexachloroethane Indeno(1,2,3-cd)pyrene	ND ND ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as:	rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as	rec'd
	J	(Detected, but below quantitation limit; estimated value)	_

(Compound detected in method blank associated with this sample)

(Not Analyzed)



LAB #: 3C3109-1

MATRIX: WATER

DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/ 2/93

DATE ANALYZED: 4/21/93

SAMPLE ID: KYW-103-MW-3

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	130
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	12 ND ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd J (Detected, but below quantitation limit: estimated value)

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	77	(22-135)	(10-155)
Fluorobiphenyl	70	(34-140)	(12-153)
Terphenyl-d14	23	(10-132)	(13-140)



SAMPLE ID: KYW-103-MW-3

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.

LAB #: 3C3109-1 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/2/93
DATE ANALYZED: 4/21/93

KEY WEST CTO7

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

HRS84297

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol 2,4,6-Trichlorophenol	ND ND

NOTE:	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
	-1	All the state of t
	J	(Detected, but below quantitation limit; estimated value)
	•	A Common which did not be a second of the se
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
2-Fluorophenol	57	(17-95)	(24-118)
Phenol-d5	114	(11-89)	(17-124)
2,4,6-Tribromophenol	46	(10-134)	(10-156)



LAB #: 3C3109-1

MATRIX: WATER

DATE RECEIVED:

3/31/93 4/ 2/93

DATE EXTRACTED:

DATE ANALYZED:

4/21/93

SAMPLE ID: KYW-103-MW-3

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

16 ug/L 140 ug/L

EXTRACTABLE ORGANICS

OTHER COMPOUNDS

1-Methylnaphthalene 2-Methylnaphthalene

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Cyclohexane, octyl	40	ug/L
Octane, 2, 3, 6-trimethyl	22	ug/L
Dodecane, 2, 6, 10-trimethyl	80	ug/L
Naphthalene, 1, 7 - dimethyl	160	ug/L
Naphthalene, 1, 2-dimethyl	48	ug/L
Nonane, 2, 6-dimethyl	81	ug/L
Naphthalene, 1, 6, 7 - trimethyl	46	ug/L
Naphthalene, 1, 4, 6-trimethyl	53	ug/L
Pentadecane, 2, 6, 10, 14-tetramethyl	110	ug/L
Dodecane, 2, 7, 10 - trimethyl	59	ug/L



DATE RECEIVED: 3/31/93

LAB #: 3C3109-1 MATRIX : WATER

SAMPLE ID : KYW-103-MW-3

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
4/14- 4/15/93	ND	50 ug/L
4/14- 4/15/93	ND	10 ug/L
4/14- 4/15/93	ND	100 ug/L
4/14- 4/15/93	ND	10 ug/L
4/14- 4/15/93	ND	50 ug/L
4/16- 4/17/93	ND	2 ug/L
4/14- 4/16/93	ND	50 ug/L
4/14- 4/16/93	ND	20 ug/L
	ANALYSIS DATE 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/16- 4/17/93	ANALYSIS DATE RESULT 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/16/93 ND



DATE RECEIVED: 3/31/93

LAB #: 3C3109-1 MATRIX : WATER

SAMPLE ID : KYW-103-MW-3 KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION ANALYSIS DATE RESULT DETECTION LIMIT PARAMETER 28 13 Tot Recoverable Pet Hydrocarbons 4/19/93 mg/L



LAB #: 3C3011-3

MATRIX: WATER

DATE RECEIVED:

3/30/93 NA

DATE EXTRACTED:

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW4

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

ug/L) as rec'd

ug/L) as rec'd

METHOD 602 - GC

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND Xylenes Methyl-tert-butylether 3

(None Detected, lower detectable limit = 1 ND NOTE: ND*

(None Detected, lower detectable limit =

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

101

(73-131)



LAB #: 3C3011-3 MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED:

DATE ANALYZED:

3/31/93 4/17/93

HRS84297

SAMPLE ID: KYW-103-MW4

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene ND Acenaphthylene ND Anthracene ND Benzo (a) anthracene ND Benzo(a)pyrene ND Benzo(b) fluoranthene ND Benzo (ghi) perylene ND Benzo(k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND Indeno(1,2,3-cd)pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND Naphthalene ND Phenanthrene ND Pyrene ND

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = NOTE: ND ug/L) as rec'd ND* ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY:	% .	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	101	(22-135)	(10-155)
Fluorobiphenyl	86	(34-140)	(12-153)
Terphenyl-d14	32	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-3 MATRIX : WATER

SAMPLE ID : KYW-103-MW4

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
_ead	4/12/93	ND	5	ug/L
Selenium	4/12/93	ND	5	ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-3 MATRIX : WATER

SAMPLE ID : KYW-103-MW4

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER ANALYSIS DATE RESULT LIMIT 4/14- 4/15/93 1 ND mg/L Tot Recoverable Pet Hydrocarbons

(None Detected) NOTE: ND



LAB #: 3C3011-4

MATRIX: WATER

DATE RECEIVED:

3/30/93 NA

DATE EXTRACTED:

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW5

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

ND Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene Ethylbenzene ND ND Toluene ND Xylenes 2 Methyl-tert-butylether

(None Detected, lower detectable limit = 1 NOTE: ND ND*

(None Detected, lower detectable limit =

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

99

(73 - 131)



LAB #: 3C3011-4 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/31/93

3/30/93

DATE ANALYZED:

4/17/93

HRS84297

SAMPLE ID: KYW-103-MW5

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo (a) pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(None Detected, lower detectable limit = 5 NOTE: ND ug/L) as rec'd (None Detected, lower detectable limit = ug/L) as rec'd ND* (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	99	(22-135)	(10-155)
Fluorobiphenyl	87	(34-140)	(12-153)
Terphenyl-d14	34	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-4 MATRIX : WATER

SAMPLE ID : KYW-103-MW5

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/ 8- 4/12/93	ND	10	ug/L
Barium	4/ 8- 4/12/93	ND	100	ug/L
Cadmium	4/ 8- 4/12/93	ND	10	ug/L
Chromium	4/8-4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
⊿ead	4/ 8- 4/12/93	ND	5	ug/L
Selenium	4/ 8- 4/12/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-4 MATRIX : WATER

SAMPLE ID : KYW-103-MW5

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 6 1 mg/L



LAB #: 3C3011-5 MATRIX: WATER DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA

DATE ANALYZED: 4/6/93

SAMPLE ID: KYW-103-MW6

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC HRS84297

ND Benzene Chlorobenzene ND ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene Xylenes ND Methyl-tert-butylether 5

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

-- (Not Analyzed)

limit = ug/L) as rec'c

ug/L) as rec'd

SURROGATE RECOVERY: % ACCEPTABLE LIMITS Trifluorotoluene (PID) 99 (73-131)



DATE RECEIVED:

3/30/93

LAB #: 3C3011-5 MATRIX: WATER

DATE EXTRACTED: 3/31/93

DATE ANALYZED: 4/19/93

SAMPLE ID: KYW-103-MW6

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo (a) anthracene Benzo (a) pyrene Benzo (b) fluoranthene	ND ND
Benzo(ghi)perylene Benzo(k)fluoranthene Chrysene	ND ND
Dibenz(a,h)anthracene Fluoranthene Fluorene	ND ND ND
Indeno (1,2,3-cd) pyrene 1-Methylnaphthalene 2-Methylnaphthalene	ND ND
Naphthalene Phenanthrene Pyrene	ND ND

ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd NOTE: (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE WATER	LIMITS SOLID
Nitrobenzene-d5	91	(22-135)	(10-155)
Fluorobiphenyl	80	(34-140)	(12-153)
Terphenyl-d14	47	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-5 MATRIX : WATER

SAMPLE ID : KYW-103-MW6

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/I
Arsenic	4/ 8- 4/12/93	16	10 ug/I
Barium	4/ 8- 4/12/93	ND	100 ug/I
Cadmium	4/ 8- 4/12/93	ND	10 ug/I
Chromium	4/ 8- 4/12/93	ND	50 ug/I
Mercury	4/15/93	ND	2 ug/I
Lead	4/ 8- 4/12/93	ND	5 ug/I
Selenium	4/ 8- 4/12/93	ND	5 ug/I



DATE RECEIVED: 3/30/93

LAB #: 3C3011-5 MATRIX : WATER

SAMPLE ID : KYW-103-MW6

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 ND 1 mg/L



LAB #: 3C3011-6 MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED: NA

DATE ANALYZED: 4/6/93

ug/L) as rec'd

ug/L) as rec'd

SAMPLE ID: KYW-103-MW7

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297 METHOD 602 - GC

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND ND*

(Not Analyzed)

SURROGATE RECOVERY: ACCEPTABLE LIMITS 104 (73 - 131)Trifluorotoluene (PID)



LAB #: 3C3011-6

DATE RECEIVED: DATE EXTRACTED: 3/31/93

3/30/93

MATRIX: WATER

DATE ANALYZED:

4/19/93

SAMPLE ID: KYW-103-MW7

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo (a) pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = NOTE: ND ND*

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		water solid	
Nitrobenzene-d5	96	(22-135) (10-155))
Fluorobiphenyl	74	(34-140) (12-153))
Terphenyl-d14	22	(10-132) (13-140))



DATE RECEIVED: 3/30/93

LAB #: 3C3011-6 MATRIX : WATER

SAMPLE ID : KYW-103-MW7

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/L
Arsenic	4/ 8- 4/12/93	ND	10 ug/L
Barium	4/ 8- 4/12/93	ND	100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/ 8- 4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
Lead	4/ 8- 4/12/93	ND	5 ug/L
Selenium	4/ 8- 4/12/93	ND	5 ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-6 MATRIX : WATER

SAMPLE ID : KYW-103-MW7

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 12 3 mg/L



DATE RECEIVED:

3/30/93

LAB #: 3C3011-7

DATE EXTRACTED:

NA

MATRIX: WATER

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW8

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene

Xylenes Nethyl-tert-butylether

(None Detected, lower detectable limit = 1 NOTE: ND (None Detected, lower detectable limit = ND*

ND

4

ug/L) as rec'd ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY: Trifluorotoluene (PID)

100

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-7 MATRIX: WATER DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/19/93

HRS84297

SAMPLE ID: KYW-103-MW8

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

ND
ND
ИD
ND
9
ND
ND
43
ND
ND
ND
ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	*	ACCEPTABLE LIMITS WATER SOLID	;
Nitrobenzene-d5	89	(22-135) (10-155	;)
Fluorobiphenyl	82	(34-140) (12-153)
Terphenyl-d14	28	(10-132) (13-140))



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-7 MATRIX : WATER

SAMPLE ID : KYW-103-MW8

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
4/ 8- 4/12/93	ND	50 ug/L
4/ 8- 4/12/93	ND	10 ug/L
4/ 8- 4/12/93	ND	100 ug/L
4/ 8- 4/12/93	ND	10 ug/L
4/ 8- 4/12/93	ND	50 ug/L
4/15/93	ND	2 ug/L
4/ 8- 4/12/93	ND	5 ug/L
4/ 8- 4/12/93	ND	5 ug/L
	ANALYSIS DATE 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/15/93	ANALYSIS DATE RESULT 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/15/93 ND



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-7 MATRIX : WATER

SAMPLE ID : KYW-103-MW8

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION ANALYSIS DATE RESULT PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 3 1 mg/L



LAB #: 3C3011-8

DATE RECEIVED: 3/30/93 DATE EXTRACTED: NA

MATRIX: WATER

DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW9

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

METHOD 602 - GC

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes 1 Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

107

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-8 MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED: 3/31/93

DATE ANALYZED: 4/20/93

HRS84297

SAMPLE ID: KYW-103-MW9

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo (a) anthracene Benzo (a) pyrene	ND ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND
=	

(None Detected, lower detectable limit = 5 ug/L) as rec'd NOTE: ND (None Detected, lower detectable limit = ug/L) as rec'd ND*

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	97	(22-135) (10-155)
Fluorobiphenyl	79	(34-140) (12-153)
Terphenyl-d14	21	(10-132) (13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-8 MATRIX : WATER

SAMPLE ID : KYW-103-MW9

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/L
Arsenic	4/ 8- 4/12/93	ND	
Barium	4/ 8- 4/12/93	ND	10 ug/L 100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/ 8- 4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
Lead	4/ 8- 4/12/93	ND	5 ug/L
Selenium	4/ 8- 4/12/93	5	5 ug/L

(None Detected) NOTE: ND



DATE RECEIVED: 3/30/93

LAB #: 3C3011-8 MATRIX : WATER

SAMPLE ID : KYW-103-MW9

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 27 13 mg/L



DATE RECEIVED:

3/30/93

LAB #: 3C3011-9 MATRIX: WATER DATE EXTRACTED:
DATE ANALYZED:

NA 4/7/93

SAMPLE ID: KYW-103-MW10

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC HRS84297

Benzene ND
Chlorobenzene ND
1,2-Dichlorobenzene ND

1,3-Dichlorobenzene ND

1,4-Dichlorobenzene ND Ethylbenzene ND

Toluene ND Xylenes ND

Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1 ND* (None Detected, lower detectable limit =

ug/L) as rec'd ug/L) as rec'd

-- (Not Analyzed)

SURROGATE RECOVERY: Trifluorotoluene (PID)

103

ACCEPTABLE LIMITS (73-131)



DATE RECEIVED: DATE EXTRACTED: 4/ 1/93

3/30/93

HRS84297

LAB #: 3C3011-9 MATRIX: WATER

DATE ANALYZED: 4/20/93

SAMPLE ID: KYW-103-MW10

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo(a)pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd NOTE: --(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE L	IMITS
		water s	OLID
Nitrobenzene-d5	96	(22-135) (1	0-155)
Fluorobiphenyl	81	(34-140) (1	2-153)
Terphenyl-d14	49	(10-132) (1	3-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-9 MATRIX : WATER

SAMPLE ID : KYW-103-MW10

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/ 8- 4/12/93	ND	50 t	ug/L
Arsenic	4/ 8- 4/12/93	ND	10 1	ug/L
Barium	4/ 8- 4/12/93	ND		ug/L
Cadmium	4/ 8- 4/12/93	ND	10	ug/L
Chromium	4/15/93	ND		ug/L
Mercury	4/15/93	ND		ug/L
ь́ead	4/ 8- 4/12/93	ND	. 5 1	ug/L
Selenium	4/ 8- 4/12/93	ND		ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-9 MATRIX : WATER

SAMPLE ID : KYW-103-MW10

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION ANALYSIS DATE RESULT LIMIT PARAMETER 1 mg/L Tot Recoverable Pet Hydrocarbons 4/14-4/15/93 ND



LAB #: 3C3011-10

MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/30/93 NA

DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW11

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND ND Ethylbenzene ND Toluene Xylenes ND Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

ug/L) as rec'd ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY: Trifluorotoluene (PID)

100

ACCEPTABLE LIMITS (73 - 131)



DATE RECEIVED:

3/30/93

LAB #: 3C3011-10

DATE EXTRACTED:

4/ 1/93

MATRIX: WATER

Pyrene

3C30TI-IO

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-MW11

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene ND Acenaphthylene ND Anthracene ND Benzo (a) anthracene ND Benzo (a) pyrene ND Benzo (b) fluoranthene ND ND Benzo (ghi) perylene Benzo(k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND Indeno (1, 2, 3-cd) pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND Naphthalene ND Phenanthrene ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd

- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	103	(22-135)	(10-155)
Fluorobiphenyl	84	(34-140)	(12-153)
Terphenyl-d14	36	(10-132)	(13-140)

ND



DATE RECEIVED: 3/30/93

LAB #: 3C3011-10 MATRIX : WATER

SAMPLE ID : KYW-103-MW11

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/ 8- 4/12/93	ND	50	ug/L
Arsenic	4/ 8- 4/12/93	ND	10	ug/L
Barium	4/ 8- 4/12/93	ND	100	ug/L
Cadmium	4/ 8- 4/12/93	ND	10	ug/L
Chromium	4/ 8- 4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
_ead	4/12/93	ND	5	ug/L
Selenium	4/12/93	ND	5	ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-10 MATRIX : WATER

SAMPLE ID : KYW-103-MW11

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE RESULT		DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/14- 4/15/93	1	1	mg/L



LAB #: 3C3109-3

SAMPLE ID: KYW-103-MW-12

DATE RECEIVED: DATE EXTRACTED: DATE ANALYZED:

3/31/93 NA 4/ 9/93

HRS84297

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene(Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene	6
Carbon tetrachloride Chlorobenzene Chloroethane	ND ND	Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND
2-Chloroethylvinyl ether	ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	1
Chloroform	ND		ND
Chloromethane	ND		ND
Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene	ND ND ND	Trichloroethene Trichlorofluoromethane Vinyl chloride	ND ND
1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane	ND ND ND	Xylene(Total)	8

(None Detected, lower detectable limit = 1 NOTE: ND ug/L) as rec'd (None Detected, lower detectable limit = 10 ND* ug/L) as rec'd ND** (None Detected, lower detectable limit = ug/L) as rec'd (Detected, but below quantitation limit; estimated value) J (Compound detected in method blank associated with this sample) В (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
		WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	94	(75-123)	(85-126)	(85-138)
Toluene-d8	106	(75-123)	(89 - 124)	(89 - 128)
Bromofluorobenzene	97	(86-115)	(84 - 124)	(83-128)



LAB #: 3C3109-3 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/31/93

DATE ANALYZED:

NA 4/ 9/93

SAMPLE ID: KYW-103-MW-12

KEY WEST CTO7

VOLATILE ORGANICS OTHER COMPOUNDS

CERTIFICATION #: E84059

HRS84297

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Indane 1-Methyl indan 22 ug/L 9 ug/L



LAB #: 3C3109-3

MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/2/93

DATE ANALYZED: 4/22/93

SAMPLE ID: KYW-103-MW-12

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	290	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	70	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo (b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	130
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	160
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:	ND	(None Detected, lower detectable limit = 52 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 260 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)



LAB #: 3C3109-3

SAMPLE ID: KYW-103-MW-12

DATE RECEIVED: 3/31/93 DATE EXTRACTED:

4/ 2/93

DATE ANALYZED: 4/22/93

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	340
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	260 ND ND

NOTE:	ND	(None Detected, lower detectable limit = 52 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 260 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)
	D	(Compound detected in method blank aggediated with this gamele)

(Compound detected in method blank associated with this sample)

SURROGATE RECOVERY:	ૠ	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	DIL	(22-135) (10-155)
Fluorobiphenyl	DIL	(34-140) (12-153)
Terphenyl-d14	DIL	(10-132) (13-140)



LAB #: 3C3109-3 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93 DATE ANALYZED: 4/22/93

SAMPLE ID: KYW-103-MW-12

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND ND*
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 52 (None Detected, lower detectable limit = 260 NOTE: ND ug/L) as rec'd ND* ug/L) as rec'd (Detected, but below quantitation limit; estimated value) J

В (Compound detected in method blank associated with this sample)

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS
		WATER	SOLID
2-Fluorophenol	DIL	(17-95)	(24-118)
Phenol-d5	DIL	(11-89)	(17 - 124)
2,4,6-Tribromophenol	DIL	(10-134)	(10-156)



LAB #: 3C3109-3

1-Methylnaphthalene

2-Methylnaphthalene

SAMPLE ID: KYW-103-MW-12

DATE RECEIVED:
DATE EXTRACTED:
DATE ANALYZED:

3/31/93 4/ 2/93 4/22/93

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059 HRS84297

50 ug/L

EXTRACTABLE ORGANICS OTHER COMPOUNDS

130 ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Naphthalene, 1, 6-dimethyl Naphthalene, 1, 7-dimethyl 1H-Indene, octahydro-2, 2, 4, 4, 77-hexamethyl-, trans	21 26 31	ug/L ug/L ug/L
1,2,4,6-Tetrathiepane 1,1'-Biphenyl,4-methyl Naphthalene,1-(2-propenyl)	220 57 36	ug/L ug/L ug/L
Lenthionine Pentadecane, 2, 6, 10, 14-tetramethyl 5H-Indeno[1, 2-b] pyridine	62 21 21	ug/L ug/L ug/L
Sulfur, mol.	21	ug/L



DATE RECEIVED: 3/31/93

LAB #: 3C3109-3 MATRIX : WATER

SAMPLE ID : KYW-103-MW-12

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/14- 4/15/93	ND	50 ug/	'L
Arsenic	4/14- 4/15/93	ND	10 ug/	
Barium	4/14- 4/15/93	ND	100 ug/	
Cadmium	4/14- 4/15/93	ND	10 ug/	L
Chromium	4/14- 4/15/93	ND	50 ug/	
Mercury	4/17- 4/16/93	ND	2 ug/	
Lead	4/14- 4/16/93	ND	50 ug/	'L
Selenium	4/14- 4/16/93	ND	20 ug/	



DATE RECEIVED: 3/31/93

LAB #: 3C3109-3 MATRIX : WATER

SAMPLE ID : KYW-103-MW-12

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION RESULT LIMIT		
Tot Recoverable Pet Hydrocarbons	4/19/93	16	13	mg/L	



LAB #: 3C3109-2 MATRIX: WATER

#: 3C3109-2

SAMPLE ID: KYW-103-MW-13

KEY WEST CTO7

CERTIFICATION #: E84059

DATE RECEIVED:

DATE ANALYZED:

DATE EXTRACTED:

HRS84297

ug/L) as rec'd

ug/L) as rec'd

3/31/93

4/ 6/93

NA

VOLATILE ORGANICS METHOD 602 - GC

ND Benzene Chlorobenzene ND ND 1,2-Dichlorobenzene 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND ND Ethylbenzene ND Toluene ND Xylenes ND Methyl-tert-butylether

NOTE: ND (None Detected, lower detectable limit = 1 ND* (None Detected, lower detectable limit =

-- (Not Analyzed)

SURROGATE RECOVERY: STrifluorotoluene (PID) 98

ACCEPTABLE LIMITS (73-131)

(73-



LAB #: 3C3109-2 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/ 1/93

HRS84297

DATE ANALYZED: 4/21/93

SAMPLE ID: KYW-103-MW-13

KEY WEST CTO7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd

SURROGATE RECOVERY:	%	ACCEPTABLE	E LIMITS
		WATER	SOLID
Nitrobenzene-d5	77	(22-135)	(10-155)
Fluorobiphenyl	61	(34-140)	(12-153)
Terphenyl-d14	31	(10-132)	(13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/31/93

LAB #: 3C3109-2 MATRIX : WATER

SAMPLE ID : KYW-103-MW-13

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
4/14- 4/15/93	ND	50 ug/L
4/14- 4/15/93	ND	10 ug/L
4/14- 4/15/93	110	100 ug/L
4/14- 4/15/93	ND	10 ug/L
4/14- 4/15/93	ND	50 ug/L
4/16- 4/17/93	ND	2 ug/L
4/14- 4/16/93	230	50 ug/L
4/14- 4/16/93	ND	20 ug/L
	ANALYSIS DATE 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93 4/16- 4/17/93	ANALYSIS DATE RESULT 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/14- 4/15/93 110 4/14- 4/15/93 ND 4/14- 4/15/93 ND 4/16- 4/17/93 ND 4/14- 4/16/93 230



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/31/93

LAB #: 3C3109-2 MATRIX : WATER

SAMPLE ID: KYW-103-MW-13 KEY WEST CT07

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION ; ANALYSIS DATE RESULT		DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/19/93	18	13	mg/L



LAB #: 3C3011-11

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW14

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

1 Benzene ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1.3-Dichlorobenzene ND 1,4-Dichlorobenzene 2 Ethylbenzene ND Toluene Xylenes 8 Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

ACCEPTABLE LIMITS (73 - 131)

SURROGATE RECOVERY: Trifluorotoluene (PID)

102



DATE RECEIVED:

3/30/93

LAB #: 3C3011-11

DATE EXTRACTED: 4/ 1/93

4/20/93

MATRIX: WATER

DATE ANALYZED:

SAMPLE ID: KYW-103-MW14

KEY WEST-CTO 7

CERTIFICATION #: E84059 ONS HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene	ND
Benzo(a)pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	220
2-Methylnaphthalene	210
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE:	(None Detected, (None Detected,				rec'd
	 (Not Analyzed)				

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	DIL	(22-135) (10-155)
Fluorobiphenyl	DIL	(34-140) (12-153)
Terphenyl-d14	DIL	(10-132) (13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-11 MATRIX : WATER

SAMPLE ID : KYW-103-MW14

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/ 8- 4/12/93	ND	50 ug/L
Arsenic	4/ 8- 4/12/93	15	10 ug/L
Barium	4/ 8- 4/12/93	ND	100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/ 8- 4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
Lead	4/ 8- 4/12/93	7	5 ug/L
Selenium	4/ 8- 4/12/93	ND	5 ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-11 MATRIX : WATER

SAMPLE ID : KYW-103-MW14

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 600 50 mg/L



LAB #: 3C3011-12 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/30/93 NA

DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW15

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

HRS84297

Benzene ND ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec'd

ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

100

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-12

SAMPLE ID: KYW-103-MW15

DATE RECEIVED: 3/30/93 DATE EXTRACTED: 4/ 1/93 DATE ANALYZED: 4/18/93

MATRIX: WATER

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND
- 4	

(None Detected, lower detectable limit = 5 NOTE: ND ug/L) as rec'd (None Detected, lower detectable limit = ND* ug/L) as rec'd (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER SOLID
Nitrobenzene-d5	91	(22-135) (10-155)
Fluorobiphenyl	77	(34-140) (12-153)
Terphenyl-d14	24	(10-132) (13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-12 MATRIX : WATER

SAMPLE ID : KYW-103-MW15

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
4/8-4/12/93	ND	50 10	ug/L ug/L
4/ 8- 4/12/93	ND	100	ug/L
4/ 8- 4/12/93 4/ 8- 4/12/93	ND ND	10 50	ug/L ug/L
4/15/93	ND	2	ug/L
4/12/93 4/12/93	ND ND	5 5	ug/L ug/L
	ANALYSIS DATE 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/15/93	ANALYSIS DATE RESULT 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/15/93 ND	ANALYSIS DATE RESULT LIMIT 4/8-4/12/93 ND 50 4/8-4/12/93 ND 10 4/8-4/12/93 ND 100 4/8-4/12/93 ND 10 4/8-4/12/93 ND 50 4/15/93 ND 50 4/12/93 ND 5



DATE RECEIVED: 3/30/93

LAB #: 3C3011-12 MATRIX : WATER

SAMPLE ID : KYW-103-MW15

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	ſ
Tot Recoverable Pet Hydrocarbons	4/14- 4/15/93	61	25	mg/L



LAB #: 3C3109-4 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED:

DATE ANALYZED: 4/9/93

NA

HRS84297

SAMPLE ID: KYW-103-MW-16

(Not Analyzed)

KEY WEST CTO7

CERTIFICATION #: E84059

VOLATILE ORGANICS

USEPA METHOD 624 - GC/MS

	Acrolein	ND*	1,1-Dichloroethene	ND
	Acrylonitrile	ND*	1,2-Dichloroethene(Total)	1
	Benzene	ND	1,2-Dichloropropane	ND
	Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
	Bromoform	ND	trans-1,3-Dichloropropene	ND
	Bromomethane	ND	Ethylbenzene	ND
	Carbon tetrachloride	ND	Methylene chloride	ND
	Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
١,	Chloroethane	ND	Tetrachloroethene	ND
	2-Chloroethylvinyl ether	ND	Toluene	ND
	Chloroform	ND	1,1,1-Trichloroethane	ND
	Chloromethane	ND	1,1,2-Trichloroethane	ND
	Dibromochloromethane	ND	Trichloroethene	ND
	1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
	1,3-Dichlorobenzene	ND	Vinyl chloride	ИD
	1,4-Dichlorobenzene	ND	Xylene (Total)	ND
	1,1-Dichloroethane	ND	-	
	1,2-Dichloroethane	ND		

NOTE:		(None Detected, lower detectable limit = 1 ug/L) as rec'c (None Detected, lower detectable limit = 10 ug/L) as rec'c (None Detected, lower detectable limit = ug/L) as rec'c
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
		WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	91	(75-123)	(85-126)	(85-138)
Toluene-d8	105	(75-123)	(89 - 124)	(89-128)
Bromofluorobenzene	94	(86-115)	(84 - 124)	(83-128)



LAB #: 3C3109-4 MATRIX: WATER

B #: 3C3109-4

TD1 1750 0000

SAMPLE ID: KYW-103-MW-16 KEY WEST CTO7

VOLATILE ORGANICS OTHER COMPOUNDS CERTIFICATION #: E84059

DATE RECEIVED:

DATE EXTRACTED:

DATE ANALYZED:

HRS84297

3/31/93

4/ 9/93

NA

Acetone Carbon disulfide 33 ug/L 4 ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Napthalene	280	ug/L
(1-Methylethyl) benzene	16	ug/L
Propyl benzene	6	ug/L
2-Propenyl benzene	11	ug/L
1-Methyl-4-(1-methylethyl) benzene	8	ug/L
1-Methyl-2-(1-methylethyl) benzene	7	ug/L
2,3-Dihydro-1-methyl indene	6	ug/L
1,2,4,5-Tetramethyl benzene	12	ug/L
1-Methyl napthalene	31	ug/L
2,4-Dimethyl-1-(1-methylethyl) benzene	6	ug/L



LAB #: 3C3109-4 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/2/93
DATE ANALYZED: 4/21/93

SAMPLE ID: KYW-103-MW-16

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene Acenaphthylene	ND ND	Dibenzo (a, h) anthracene Di-n-butyl phthalate	ND ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:	ND ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)



LAB #: 3C3109-4

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/2/93

DATE ANALYZED: 4/21/93

MATRIX: WATER

SAMPLE ID: KYW-103-MW-16

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
•	
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)
	_	

(Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	*	ACCEPTABLE WATER	LIMITS SOLID
Nitrobenzene-d5	78	(22-135)	(10-155)
Fluorobiphenyl	66	(34-140)	(12-153)
Terphenyl-d14	15	(10-132)	(13-140)



LAB #: 3C3109-4 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93 DATE ANALYZED: 4/21/93

HRS84297

SAMPLE ID: KYW-103-MW-16

KEY WEST CTO7

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND,
2-Nitrophenol	ND
4-Nitrophenol	ND.
Pentachlorophenol	ND
Phenol	ND
2,4,6-Trichlorophenol	ND

(None Detected, lower detectable limit = 10 ug/L) (None Detected, lower detectable limit = 50 ug/L) (Detected, but below quantitation limit; estimated value) ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* J (Compound detected in method blank associated with this sample) В (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
2-Fluorophenol	59	(17-95)	(24-118)
Phenol-d5	122	(11-89)	(17-124)
2,4,6-Tribromophenol	39	(10-134)	(10-156)



LAB #: 3C3109-4

MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/31/93 4/ 2/93

DATE ANALYZED:

4/21/93

HRS84297

SAMPLE ID: KYW-103-MW-16

KEY WEST CTO7

EXTRACTABLE ORGANICS OTHER COMPOUNDS

CERTIFICATION #: E84059

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Octane, 2, 3, 7-trimethyl Naphthalene, 18-dimethyl 1H-Idene, octahydro-2, 2, 4, 4, 7, 7-hexamethyl-, trans	25 11 28	ug/L ug/L ug/L
Heptadecane, 2, 6, 10, 14-tetramethyl Pentadecane, 2, 6, 10, 14-tetramethyl Unknowns total	33 40 46	ug/L ug/L ug/L



Total metals analysis results - as received

DATE RECEIVED: 3/31/93

LAB #: 3C3109-4 MATRIX : WATER

SAMPLE ID : KYW-103-MW-16

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/14- 4/15/93	ND	50 ug/L
Arsenic	4/14- 4/15/93	ND	10 ug/L
Barium	4/14- 4/15/93	120	100 ug/L
Cadmium	4/14- 4/15/93	ND	10 ug/L
Chromium	4/14- 4/15/93	ND	50 ug/L
Mercury	4/16- 4/17/93	ND	2 ug/L
Lead	4/14- 4/16/93	ND	50 ug/L
Selenium	4/14- 4/16/93	ND	20 ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/31/93

LAB #: 3C3109-4 MATRIX : WATER

SAMPLE ID : KYW-103-MW-16 KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	ī
Tot Recoverable Pet Hydrocarbons	4/19/93	7	2	mg/L
TOU RECOVERABLE FEU MYGIOCALBONS	マ/エフ/フン	,	3	mq/L



LAB #: 3C3109-5 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/9/93

SAMPLE ID: KYW-103-MW-17

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

	Acrolein	ND*	1,1-Dichloroethene	ND
	Acrylonitrile	ND*	1,2-Dichloroethene(Total)	ND
	Benzene	ND	1,2-Dichloropropane	ND
	Denzene		a, a dadaaaagaagaagaa	
	Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
	Bromoform	ND	trans-1,3-Dichloropropene	ND
	Bromomethane	ND	Ethylbenzene	ND
	Bromome charte	112	neny inchie	
	Carbon tetrachloride	ND	Methylene chloride	ND
	Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
		ND	Tetrachloroethene	ND
L,	Chloroethane	MD	Tettachtoroethene	ND
	2-Chloroethylvinyl ether	ND	Toluene	ND
		ND	1,1,1-Trichloroethane	ND
	Chloroform			
	Chloromethane	ND	1,1,2-Trichloroethane	ND
		100	Trichloroethene	ND
	Dibromochloromethane	ND		
	1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
	1,3-Dichlorobenzene	ND	Vinyl chloride	ND
	4 4 51 -1-3 1	1 50	V1 (Mahal)	ND
	1,4-Dichlorobenzene	ND	Xylene(Total)	MD
	1,1-Dichloroethane	ND		
	1,2-Dichloroethane	ND		

NOTE:		(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = 10 (None Detected, lower detectable limit =	ug/L) ug/L) ug/L)	as	rec'd
	J	(Detected, but below quantitation limit; estimated	value)		
	В	(Compound detected in method blank associated with	this samp	ple)	
		(Not Analyzed)			

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER SOLID	LOW LEVEL
1.2-Dichloroethane	93	(75-123) (85-126)	
Toluene-d8	101	(75-123) (89-124)	(89-128)
Bromofluorobenzene	94	(86-115) (84-124)	(83-128)



LAB #: 3C3109-5 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/31/93 NA

DATE ANALYZED:

4/ 9/93

SAMPLE ID: KYW-103-MW-17

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

15 ug/L

3 ug/L

VOLATILE ORGANICS OTHER COMPOUNDS

OTHER COMPOUNI

Acetone Carbon disulfide

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Napthalene	5	ug/L
2,3-Dihydro-1,2-dimethyl-1H-indene	6	ug/L
1-(3-nitrophenyl) ethanone	7	ug/L
1,3-Dimethyl napthalene	1 4	ug/L
1-Methyl napthalene	8	ug/L



LAB #: 3C3109-5 MATRIX: WATER DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/2/93
DATE ANALYZED: 4/21/93

HRS84297

SAMPLE ID: KYW-103-MW-17

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene ND Dibenzo (a, h) anthracene ND Acenaphthylene ND Di-n-butyl phthalate ND Anthracene ND 1,2-Dichlorobenzene ND Benzidine ND* 1,3-Dichlorobenzene ND Benzo (a) anthracene 1,4-Dichlorobenzene ND ND 3,3'-Dichlorobenzidine Benzo (b) fluoranthene ND ND* Benzo(k) fluoranthene ND Diethyl phthalate ND Benzo (ghi) perylene Dimethyl phthalate ND ND Benzo(a)pyrene ND 2,4-Dinitrotoluene ND Bis (2-Chloroethoxy) methane ND 2,6-Dinitrotoluene ND Bis (2-Chloroethyl) ether ND Di-n-octyl phthalate ND Bis (2-Chloroisopropyl) ether ND Fluoranthene ND Bis (2-Ethylhexyl) phthalate Fluorene ND ND Hexachlorobenzene 4-Bromophenyl phenyl ether ND ND Hexachlorobutadiene Butyl benzyl phthalate ND ND 2-Chloronaphthalene ND Hexachlorocyclopentadiene ND 4-Chlorophenyl phenyl ether ND Hexachloroethane ND Chrysene ND Indeno (1, 2, 3-cd) pyrene ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd J (Detected, but below quantitation limit; estimated value)

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)



LAB #: 3C3109-5

MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93 DATE ANALYZED: 4/21/93

SAMPLE ID: KYW-103-MW-17

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone Naphthalene Nitrobenzene	ND ND
N-Nitrosodimethylamine N-Nitrosodiphenylamine N-Nitrosodi-n-propylamine	ND ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	ND ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER SOLID	
Nitrobenzene-d5	67	(22-135) (10-155)
Fluorobiphenyl	59	(34-140) (12-153)
Terphenyl-d14	21	(10-132) (13-140)



LAB #: 3C3109-5 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93 DATE ANALYZED: 4/21/93

HRS84297

SAMPLE ID: KYW-103-MW-17

KEY WEST CTO7

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND
2-Methyl-4,6-dinitrophenol	ND
2-Nitrophenol	ND
4-Nitrophenol	ND
Pentachlorophenol	ND
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = 50 ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Detected, but below quantitation limit; estimated value) J

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

%	ACCEPTABLE LIMITS	Š
	WATER SOLID	
54	(17-95) (24-118	3)
124	(11-89) (17-124	Ł)
37	(10-134) (10-156	5)
	124	54 (17-95) (24-118 124 (11-89) (17-124



SAMPLE ID: KYW-103-MW-17

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.

LAB #: 3C3109-5

DATE RECEIVED: DATE EXTRACTED: DATE ANALYZED:

دد/31/3 4/ 2/93 4/21/93

HRS84297

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

EXTRACTABLE ORGANICS OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS with their estimated concentrations

Dodecane, 2, 6, 11-trimethyl 1H-Indene, octahydro-2, 2, 4, 4, 7, 7-hexamethyl-, trans Decane, 3, 6-dimethyl	8 7 13	ug/L ug/L ug/L
Dodecane, 2, 7, 10-trimethyl 1-Unknown	16 7	ug/L ug/L



DATE RECEIVED: 3/31/93

LAB #: 3C3109-5 MATRIX : WATER

SAMPLE ID : KYW-103-MW-17 KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/14- 4/15/93	ND	50	ug/L
Arsenic	4/14- 4/15/93	ND	10	ug/L
Barium	4/14- 4/15/93	120	100	ug/L
Cadmium	4/14- 4/15/93	ND	10	ug/L
Chromium	4/14- 4/15/93	ND	50	ug/L
Mercury	4/17/93	ND	2	ug/L
Lead	4/14- 4/16/93	ND	50	ug/I
Selenium	4/14- 4/16/93	ND	20	ug/I



DATE RECEIVED: 3/31/95

LAB #: 3C3109-5 MATRIX : WATER

SAMPLE ID : KYW-103-MW-17 KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER ANALYSIS DATE RESULT LIMIT Tot Recoverable Pet Hydrocarbons 4/19/93 4 1 mg/L



LAB #: 3C3011-13

DATE RECEIVED: DATE EXTRACTED: NA

3/30/93

DATE ANALYZED:

4/ 6/93

HRS84297

ug/L) as rec'd

ug/L) as rec'c

MATRIX: WATER

SAMPLE ID: KYW-103-MW18

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Methyl-tert-butylether	ND

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

101

(73-131)



LAB #: 3C3011-13

DATE RECEIVED: DATE EXTRACTED: 4/ 1/93

3/30/93

MATRIX: WATER

DATE ANALYZED: 4/18/93

SAMPLE ID: KYW-103-MW18

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene Phenanthrene Pyrene	ND ND

NOTE: (None Detected, lower detectable limit = 5 ug/L) as rec'd ug/L) as rec'd ND (None Detected, lower detectable limit = ND* (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	92	(22-135)	(10-155)
Fluorobiphenyl	85	(34-140)	(12-153)
Terphenyl-d14	38	(10-132)	(13-140)



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-13 MATRIX : WATER

SAMPLE ID : KYW-103-MW18

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	10 u	g/I
Arsenic	4/12/93	ND		g/I
Barium	4/12/93	ND		g/I
Cadmium	4/12/93	ND	50 ບ	ig/I
Chromium	4/12/93	ND		ig/I
Mercury	4/15/93	ND		ig/I
Lead	4/ 8- 4/12/93	ND		ıg/I
Selenium	4/ 8- 4/12/93	ND		ıg/I



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-13 MATRIX : WATER

SAMPLE ID : KYW-103-MW18

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - ANALYSIS DATE RESULT DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 3 mg/L



LAB #: 3C3011-14

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW19

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC HRS84297

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes fethyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

-- (Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID) % 101 ACCEPTABLE LIMITS (73-131)



LAB #: 3C3011-14

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED: 4/ 1/93

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-MW19

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo(a) anthracene	ND
Benzo(a) pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene Benzo(k)fluoranthene Chrysene	ND ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene Phenanthrene Pyrene	ND ND

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = NOTE: ND ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd



SURROGATE RECOVERY:	ૠ	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	101	(22-135)	(10-155)
Fluorobiphenyl	85	(34-140)	(12-153)
Terphenyl-d14	37	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-14 MATRIX : WATER

SAMPLE ID : KYW-103-MW19

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/ 8- 4/12/93	ND	50 u	g/L
Arsenic	4/ 8- 4/12/93	ND		g/L
Barium	4/ 8- 4/12/93	ND		g/L
Cadmium	4/ 8- 4/12/93	ND	10 u	g/L
Chromium	4/ 8- 4/12/93	ND		g/L
Mercury	4/15/93	ND		g/L
Lead	4/ 8- 4/12/93	ND	. 5 u	g/L
Selenium	4/ 8- 4/12/93	ND		g/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-14 MATRIX : WATER

SAMPLE ID : KYW-103-MW19

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -ANALYSIS DATE RESULT PREPARATION -DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND 1 mg/L



LAB #: 3C3109-6 MATRIX: WATER

SAMPLE ID: KYW-103-MW-20D

KEY WEST CTO7

CERTIFICATION #: E84059

DATE RECEIVED:

DATE EXTRACTED:

DATE ANALYZED:

HRS84297

ug/L) as rec'd ug/L) as rec'd

3/31/93

4/ 6/93

NA

VOLATILE ORGANICS METHOD 602 - GC

Benzene Chlorobenzene 1,2-Dichlorobenzene	ND ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	6
Toluene	2
Xylenes	11
Methyl-tert-butylether	ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID) 97 (73-131)



LAB #: 3C3109-6 MATRIX: WATER

Naphthalene

Pyrene

Phenanthrene

DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/22/93

SAMPLE ID: KYW-103-MW-20D

KEY WEST CTO7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	98
Acenaphthylene	ND
Anthracene	24
Benzo (a) anthracene Benzo (a) pyrene Benzo (b) fluoranthene	ND ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	26
Fluorene	56
Indeno (1,2,3-cd) pyrene	ND
1-Methylnaphthalene	90
2-Methylnaphthalene	68

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	
Nitrobenzene-d5	99	(22-135)	10-155)	
Fluorobiphenyl	89	(34-140) (12-153)	
Terphenyl-d14	41	(10-132) (13-140)	

250

110

26



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/31/93

LAB #: 3C3109-6 MATRIX : WATER

SAMPLE ID : KYW-103-MW-20D KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/14- 4/15/93	ND	50 ug/L
Arsenic	4/14- 4/15/93	ND	10 ug/L
Barium	4/14- 4/15/93	ND	100 ug/L
Cadmium	4/14- 4/15/93	ND	10 ug/L
Chromium	4/14- 4/15/93	ND	50 ug/L
Mercury	4/17/93	ND	2 ug/L
Lead	4/14- 4/16/93	ИD	50 ug/I
Selenium	4/14- 4/16/93		20 ug/I



DATE RECEIVED: 3/31/93

LAB #: 3C3109-6 MATRIX : WATER

SAMPLE ID : KYW-103-MW-20D KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LT LIMIT	
Tot Recoverable Pet Hydrocarbons	4/19/93	2	1 mg/I	



LAB #: 3C3011-15

DATE RECEIVED: DATE EXTRACTED: 3/30/93 NA

MATRIX: WATER

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW21

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

101

(73 - 131)



LAB #: 3C3011-15

SAMPLE ID: KYW-103-MW21

MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED: 4/ 1/93

DATE ANALYZED:

4/18/93

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(Not Analyzed)

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = NOTE: ND ug/L) as rec'd ND* ug/L) as rec'd

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	
Nitrobenzene-d5	94	(22-135)	(10-155)	
Fluorobiphenyl	83	(34-140)	(12-153)	
Terphenyl-d14	44	(10-132)	(13-140)	



DATE RECEIVED: 3/30/93

LAB #: 3C3011-15 MATRIX : WATER

SAMPLE ID : KYW-103-MW21

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver Arsenic Barium	4/ 8- 4/12/93 4/ 8- 4/12/93 4/ 8- 4/12/93	ND ND	50 10 100	ug/L ug/L ug/L
Cadmium	4/ 8- 4/12/93	ND	10	ug/L
Chromium	4/ 8- 4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
iead	4/ 8- 4/13/93	ND	5	ug/L
Selenium	4/ 8- 4/16/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-15 MATRIX : WATER

SAMPLE ID : KYW-103-MW21

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND 1 mg/L



LAB #: 3C3011-16

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW22

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

METHOD 602 - GC

Benzene Chlorobenzene 1,2-Dichlorobenzene	ND ND ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
<pre>lethyl-tert-butylether</pre>	ND

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

ug/L) as rec'd ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY: Trifluorotoluene (PID)

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-16

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

4/ 1/93

4/18/93

HRS84297

DATE ANALYZED:

SAMPLE ID: KYW-103-MW22

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene ND Acenaphthylene ND Anthracene ND Benzo (a) anthracene ND Benzo (a) pyrene ND Benzo (b) fluoranthene ND ND Benzo (ghi) perylene Benzo(k) fluoranthene ND ND Chrysene ND Dibenz (a, h) anthracene Fluoranthene ND Fluorene ND Indeno (1, 2, 3-cd) pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND Naphthalene ND ND Phenanthrene Pyrene ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd (None Detected, lower detectable limit = ND* ug/L) as rec'd (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMIT	rs
		WATER SOLII)
Nitrobenzene-d5	84	(22-135) (10-19	55)
Fluorobiphenyl	73	(34-140) (12-1	53)
Terphenyl-d14	41	(10-132) (13-14	10)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-16 MATRIX : WATER

SAMPLE ID : KYW-103-MW22

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver Arsenic Barium	4/ 8- 4/12/93 4/ 8- 4/12/93 4/ 8- 4/12/93	ND ND	50 ug/L 10 ug/L 100 ug/L
Cadmium	4/ 8- 4/12/93	ND	10 ug/L
Chromium	4/ 8- 4/12/93	ND	50 ug/L
Mercury	4/15/93	ND	2 ug/L
uead	4/ 8- 4/13/93	ND	5 ug/L
Selenium	4/ 8- 4/16/93	ND	5 ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-16 MATRIX : WATER

SAMPLE ID : KYW-103-MW22

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION ANALYSIS DATE RESULT DETECTION LIMIT PARAMETER 1 mg/L ND

Tot Recoverable Pet Hydrocarbons 4/13-4/14/93



LAB #: 3C3011-17 MATRIX: WATER DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA

DATE ANALYZED:

4/ 6/93

SAMPLE ID: KYW-103-MW23

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ND Benzene Chlorobenzene ND 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene 5 Toluene 6 Xylenes 31 Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

-- (Not Analyzed)

ug/L) as rec'd

ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

99

ACCEPTABLE LIMITS (73-131)



LAB #: 3C3011-17

MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/18/93

SAMPLE ID: KYW-103-MW23

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND
Benzo (a) anthracene Benzo (a) pyrene Benzo (b) fluoranthene	ND ND
Benzo(ghi)perylene Benzo(k)fluoranthene Chrysene	ND ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE:	ND	(None Detected,	lower det	ectable limit	= 5	ug/L) a	as rec'd
	ND*	(None Detected,	lower det	ectable limit	=	ug/L) a	s rec'd
	~ -	(Not Analyzed)					

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	89	(22-135)	(10-155)
Fluorobiphenyl	74	(34-140)	(12-153)
Terphenyl-d14	28	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-17 MATRIX : WATER

SAMPLE ID : KYW-103-MW23

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
4/ 8- 4/12/93	ND	50 ug/L
4/8-4/12/93	ND	10 ug/L
4/ 8- 4/12/93	ND	100 ug/L
4/ 8- 4/12/93	ND	10 ug/L
4/8-4/12/93	ND	50 ug/L
4/15/93	ND	2 ug/L
4/ 8- 4/13/93	ND	5 ug/L
4/ 8- 4/16/93	ND	5 ug/L
	ANALYSIS DATE 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/15/93 4/8-4/13/93	ANALYSIS DATE RESULT 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/13/93 ND



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-17 MATRIX : WATER

SAMPLE ID : KYW-103-MW23

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION -ANALYSIS DATE RESULT LIMIT PARAMETER 1 mg/L Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND



LAB #: 3C3011-18 MATRIX: WATER

DATE RECEIVED: NA

3/30/93

DATE EXTRACTED: DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW24

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND ND Xylenes Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: 99 (73 - 131)Trifluorotoluene (PID)



LAB #: 3C3011-18

MATRIX: WATER

Naphthalene Phenanthrene

Pyrene

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

4/ 1/93

HRS84297

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-MW24

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

ND Acenaphthene Acenaphthylene ND Anthracene ND Benzo(a) anthracene ND Benzo (a) pyrene ND Benzo (b) fluoranthene ND ND Benzo(ghi)perylene Benzo(k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND Indeno(1,2,3-cd)pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND

NOTE: ND (None Detected, lower detectable limit = 5 ND* (None Detected, lower detectable limit =

ND

ND ND

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY:	8	ACCEPTABLE L WATER S	IMITS OLID
Nitrobenzene-d5	89	(22-135) (1	0-155)
Fluorobiphenyl	83	(34-140) (1	2-153)
Terphenyl-d14	56	(10-132) (1	3-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-18 MATRIX : WATER

SAMPLE ID : KYW-103-MW24

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

PREPARATION -	ייים אינודייי	DETECTION LIMIT	
ANALISIS DAIL	RESOLI	TITALL	
4/ 8- 4/12/93	ND	50	ug/L
4/ 8- 4/12/93	ND	10	ug/L
4/ 8- 4/12/93	ND	100	ug/L
4/ 8- 4/12/93	ND	10	ug/L
4/8-4/12/93	ND	50	ug/L
4/15/93	ND	2	ug/L
4/ 8- 4/13/93	ND	5	ug/L
4/ 8- 4/13/93	ND	5	ug/L
	ANALYSIS DATE 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/8-4/12/93 4/15/93 4/8-4/13/93	ANALYSIS DATE RESULT 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/12/93 ND 4/8-4/13/93 ND	ANALYSIS DATE RESULT LIMIT 4/8-4/12/93 ND 50 4/8-4/12/93 ND 10 4/8-4/12/93 ND 100 4/8-4/12/93 ND 10 4/8-4/12/93 ND 50 4/8-4/12/93 ND 50 4/15/93 ND 2



DATE RECEIVED: 3/30/93

LAB #: 3C3011-18 MATRIX : WATER

SAMPLE ID : KYW-103-MW24

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND 1 mg/L



LAB #: 3C3011-19

DATE RECEIVED: DATE EXTRACTED: 3/30/93 NA

DATE ANALYZED:

MATRIX: WATER

4/ 6/93

SAMPLE ID: KYW-103-MW25

KEY WEST-CTO 7

CERTIFICATION #: E84059 HRS84297

VOLATILE ORGANICS

METHOD 602 - GC

ND Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes ND

Methyl-tert-butylether

(None Detected, lower detectable limit = 1 NOTE: ND (None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

114

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-19

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/18/93

SAMPLE ID: KYW-103-MW25

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene Benzo (a) pyrene Benzo (b) fluoranthene	ND ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz (a,h) anthracene Fluoranthene Fluorene	ND ND
Indeno(1,2,3-cd)pyrene 1-Methylnaphthalene 2-Methylnaphthalene	ND ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(None Detected, lower detectable limit = 5 NOTE: ND (None Detected, lower detectable limit = ND*

ug/L) as rec'd ug/L) as rec'd

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	89	(22-135)	(10-155)
Fluorobiphenyl	76	(34-140)	(12-153)
Terphenyl-d14	36	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-19 MATRIX : WATER

SAMPLE ID : KYW-103-MW25

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver Arsenic Barium	4/ 8- 4/12/93 4/ 8- 4/12/93 4/ 8- 4/12/93	ИD ND	50 ug/I 10 ug/I 100 ug/I
Cadmium	4/8-4/12/93	ND	10 ug/I
Chromium	4/8-4/12/93	ND	50 ug/I
Mercury	4/15/93	ND	2 ug/I
Lead	4/ 8- 4/13/93	ND	5 ug/I
Selenium	4/ 8- 4/16/93		5 ug/I



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-19 MATRIX : WATER

SAMPLE ID : KYW-103-MW25

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13- 4/15/93	1	1	mg/L



LAB #: 3C3011-20 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/30/93

DATE ANALYZED:

NA 4/ 6/93

SAMPLE ID: KYW-103-MW26

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND Xylenes ND Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID) 93 (73 - 131)



LAB #: 3C3011-20

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED: 4/ 1/93

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-MW26

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	6
Acenaphthylene	ND
Anthracene	ND
Benzo(a)anthracene Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1,2,3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(None Detected, lower detectable limit = 5 ug/L) as rec'd NOTE: ND (None Detected, lower detectable limit = ug/L) as rec'd ND* (Not Analyzed)

ACCEPTABLE LIMITS SURROGATE RECOVERY: ૠ SOLID WATER Nitrobenzene-d5 94 (22-135)(10-155)(34-140)80 (12-153)Fluorobiphenyl 43 (10-132) (13-140)Terphenyl-d14



DATE RECEIVED: 3/30/93

LAB #: 3C3011-20 MATRIX : WATER

SAMPLE ID : KYW-103-MW26

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
ead	4/12- 4/13/93	13	5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-20 MATRIX : WATER

SAMPLE ID : KYW-103-MW26

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 2 1 mg/L



LAB #: 3C3109-7

SAMPLE ID: KYW-103-MW-27

DATE RECEIVED: DATE EXTRACTED: DATE ANALYZED:

3/31/93 NA 4/ 6/93

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS METHOD 602 - GC

2 Benzene ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND Xylenes 2 Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec' ug/L) as rec'

SURROGATE RECOVERY: Trifluorotoluene (PID)

108

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3109-7 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 1/93 DATE ANALYZED: 4/22/93

SAMPLE ID: KYW-103-MW-27

KEY WEST CTO7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene Acenaphthylene Anthracene	ND ND ND
Benzo (a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	120
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	480
2-Methylnaphthalene	380
Naphthalene	NTD
Phenanthrene	160
Pyrene	ND

NOTE:	ND*	(None Detected,	<pre>lower detectable limit = 110 lower detectable limit =</pre>	ug/L) as rec'd ug/L) as rec'd
		(Not Analyzed)		

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
Nitrobenzene-d5	DIL	(22-135) (10-155)
Fluorobiphenyl	DIL	(34-140) (12-153)
Terphenyl-d14	DIL	(10-132)	13-140)



DATE RECEIVED: 3/31/93

LAB #: 3C3109-7 MATRIX : WATER

SAMPLE ID : KYW-103-MW-27

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/14- 4/15/93	ND	50 ug/I
Arsenic	4/14- 4/15/93	ND	10 ug/I
Barium	4/14- 4/15/93	150	100 ug/I
Cadmium	4/14- 4/15/93	12	10 ug/I
Chromium	4/14- 4/15/93	77	50 ug/I
Mercury	4/16- 4/17/93	2	2 ug/I
Lead	4/14- 4/16/93	1,200	50 ug/I
Selenium	4/14- 4/16/93	ND	20 ug/I



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/31/93

LAB #: 3C3109-7 MATRIX : WATER

SAMPLE ID : KYW-103-MW-27 KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION -PREPARATION ANALYSIS DATE RESULT LIMIT PARAMETER Tot Recoverable Pet Hydrocarbons 4/19/93 240 25 mg/L



LAB #: 3C3011-21

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 7/93

SAMPLE ID: KYW-103-MW28

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

Benzene 4 ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene 86 56 Toluene 180 Xylenes Methyl-tert-butylether ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: ACCEPTABLE LIMITS Trifluorotoluene (PID) 100 (73 - 131)



LAB #: 3C3011-21

SAMPLE ID: KYW-103-MW28

MATRIX: WATER

DATE RECEIVED: 3/30/93

DATE EXTRACTED: 4/1/93
DATE ANALYZED: 4/20/93

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	290
Acenaphthylene	ND
Anthracene	ИD
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	160
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	480
2-Methylnaphthalene	570
Naphthalene	2,200
Phenanthrene	260
Pyrene	ND

NOTE:	ND*	(None Detected,	lower detectable lower detectable	ug/L) as rec'd ug/L) as rec'd
	~ -	(Not Analyzed)		

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	DIL	(22-135) (10-155)
Fluorobiphenyl	DIL	(34-140) (12-153)
Terphenyl-d14	DIL	(10-132) (13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-21 MATRIX : WATER

SAMPLE ID : KYW-103-MW28

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

	PREPARATION -		DETECTION	
ELEMENT	ANALYSIS DATE	RESULT	LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
Lead	4/12- 4/13/93	ND	· 5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-21 MATRIX : WATER

SAMPLE ID : KYW-103-MW28

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION -ANALYSIS DATE RESULT LIMIT PARAMETER Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 7 3 mg/L



DATE RECEIVED:

3/30/93

LAB #: 3C3011-22

DATE EXTRACTED:

NA

MATRIX: WATER

DATE ANALYZED:

4/6/93

SAMPLE ID: KYW-103-MW29

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

HRS84297

ND Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes ND lethyl-tert-butylether

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

89

ACCEPTABLE LIMITS (73 - 131)



DATE RECEIVED:

3/30/93

LAB #: 3C3011-22

DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/18/93

MATRIX: WATER

SAMPLE ID: KYW-103-MW29

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
•	
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Barra (-1-1-1-)	1775
Benzo (ghi) perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
1 1 doz ene	110
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
37 - 5 4 5 - 7	
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

ND (None Detected, lower detectable limit = 5 ND* (None Detected, lower detectable limit = NOTE: ND ug/L) as rec'd ug/L) as rec'd (Not Analyzed)

SURROGATE RECOVERY:		8	ACCEPTABLE LIMITS		
			WATER	SOLID	
Nitrobenzene-	d5	90	(22-135)	(10-155)	
Fluorobipheny:	1	74	(34-140)	(12-153)	
Terphenyl-d14		29	(10-132)	(13-140)	



DATE RECEIVED: 3/30/93

LAB #: 3C3011-22 MATRIX : WATER

SAMPLE ID : KYW-103-MW29

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

	PREPARATION - Di			ETECTION	
ELEMENT	ANALYSIS DATE	RESULT	LIMIT		
Silver	4/12/93	ND	50	ug/L	
Arsenic	4/12- 4/14/93	ND	10	ug/L	
Barium	4/12/93	ND	100	ug/L	
Cadmium	4/12/93	ND	10	ug/L	
Chromium	4/12/93	ND	50	ug/L	
Mercury	4/15/93	ND	2	ug/L	
Lead	4/12- 4/13/93	ND	. 5	ug/L	
Selenium	4/12- 4/13/93	ND	5	ug/L	



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93

LAB #: 3C3011-22 MATRIX : WATER

SAMPLE ID : KYW-103-MW29

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION -ANALYSIS DATE RESULT LIMIT PARAMETER Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND mg/L



LAB #: 3C3011-23 MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED:

3/30/93

DATE ANALYZED:

NA 4/ 6/93

SAMPLE ID: KYW-103-MW30

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

HRS84297

ug/L) as rec'd

ug/L) as rec'd

METHOD 602 - GC

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND Xylenes ND Methyl-tert-butylether 2

(None Detected, lower detectable limit = 1 NOTE: ND

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID) (73 - 131)



DATE RECEIVED:

3/30/93

LAB #: 3C3011-23

DATE EXTRACTED:

4/ 1/93

MATRIX: WATER

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-MW30

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

HRS84297

METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene Acenaphthylene Anthracene	ND ND ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND
- <u>. </u>	

(None Detected, lower detectable limit = 6 (None Detected, lower detectable limit = ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE WATER	SOLID
Nitrobenzene-d5	82	(22-135)	(10-155)
Fluorobiphenyl	62	(34-140)	(12-153)
Terphenyl-d14	20	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-23 MATRIX : WATER

SAMPLE ID : KYW-103-MW30

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
ead	4/12- 4/13/93	ND	5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



LAB #: 3C3011-23 MATRIX : WATER

SAMPLE ID : KYW-103-MW30

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION ANALYSIS DATE RESULT LIMIT PARAMETER

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93

ND

1 mg/L



LAB #: 3C3109-8 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: NA DATE ANALYZED: 4/ 9/93

SAMPLE ID: KYW-SURFACE

KEY WEST CTO7

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene (Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
		• • • • • • • • • • • • • • • • • • • •	
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene	ND
		•	
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
Chloroethane	ND	Tetrachloroethene	ND
2-Chloroethylvinyl ether	ND	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ИD	Vinyl chloride	ND
1,4-Dichlorobenzene	ND	Xylene(Total)	ND
1,1-Dichloroethane	ИD		
1.2-Dichloroethane	ND		

NOTE:	ND	(None Detected, lower detectable limit = 1 ug/L)	as	rec'
	ND*	(None Detected, lower detectable limit = 10 ug/L)	as	rec'
	ND**	(None Detected, lower detectable limit = ug/L)	as	rec'
	J	(Detected, but below quantitation limit; estimated value)		
	70	(Compound detected in method blank aggodiated with this game	n1 a'	١

(Compound detected in method blank associated with this sample)

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
		WATER	SOLID	TOM TEAET
1,2-Dichloroethane	93	(75-123)	(85-126)	(85-138)
Toluene-d8	105	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	94	(86-115)	(84-124)	(83-128)



LAB #: 3C3109-8

DATE EXTRACTED: 4/ 2/93 MATRIX: WATER DATE ANALYZED:

SAMPLE ID: KYW-SURFACE

KEY WEST CTO7

CERTIFICATION #: E84059

3/31/93

4/21/93

HRS84297

DATE RECEIVED:

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo (b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo (ghi) perylene	ND	Dimethyl phthalate	ND
Benzo(a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether		Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND
<i>2</i>			

NOTE:	ND	(None Detected,	lower detectable	limit = 10	ug/L) as rec'd
	ND*	(None Detected,	lower detectable	limit = 50	ug/L) as rec'd
	J	(Detected, but	below quantitation	n limit; estimate	ed value)

(Compound detected in method blank associated with this sample) В



LAB #: 3C3109-8

MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93

DATE ANALYZED:

4/21/93

SAMPLE ID: KYW-SURFACE

KEY WEST CTO7

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	ND ND ND

(None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = 50 ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Detected, but below quantitation limit: estimated value) J (Compound detected in method blank associated with this sample) B

ACCEPTABLE LIMITS SURROGATE RECOVERY: WATER SOLID 82 (22-135)(10-155)Nitrobenzene-d5 74 (34-140)(12-153)Fluorobiphenyl

Terphenyl-d14 70 (10-132)(13-140)



LAB #: 3C3109-8

SAMPLE ID: KYW-SURFACE

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 2/93

DATE ANALYZED: 4/21/93

MATRIX: WATER

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND ND ND
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND*
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd NOTE: ND ND*

(Detected, but below quantitation limit; estimated value) J

(Compound detected in method blank associated with this sample) В

SURROGATE RECOVERY:	%	acceptable	LIMITS
		WATER	SOLID
2-Fluorophenol	65	(17-95)	(24-118)
Phenol-d5	145	(11-89)	(17-124)
2,4,6-Tribromophenol	41	(10-134)	(10-156)



LAB #: 3C3109-8 MATRIX : WATER

SAMPLE ID : KYW-SURFACE

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver Arsenic Barium	4/14- 4/15/93 4/14- 4/15/93 4/14- 4/15/93	ND ND	50 ug/L 10 ug/L 100 ug/L
Cadmium Chromium Mercury	4/14- 4/15/93 4/14- 4/15/93 4/16- 4/17/93	ND ND	10 ug/L 50 ug/L 2 ug/L
Lead Selenium	4/14- 4/16/93 4/14- 4/16/93	ND ND	50 ug/L 20 ug/L



LAB #: 3C3109-8 MATRIX : WATER

SAMPLE ID : KYW-SURFACE

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION ANALYSIS DATE RESULT PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 4/19/93 ND 1 mg/L



LAB #: 3C3011-24

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:
DATE ANALYZED:

NA 4/7/93

SAMPLE ID: KYW-103-DUP1

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

ug/L) as rec'd

ug/L) as rec'd

ND Benzene ND Chlorobenzene 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether 4

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit = 1

-- (Not Analyzed)

% ACCEPTABLE LIMITS

SURROGATE RECOVERY: % ACCEPTABLE : Trifluorotoluene (PID) 100 (73-131)



LAB #: 3C3011-24

MATRIX: WATER

DATE RECEIVED: 3/30/93 DATE EXTRACTED:

4/ 1/93

HRS84297

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-DUP1

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

ND Acenaphthene ND Acenaphthylene Anthracene ND Benzo (a) anthracene ND Benzo(a)pyrene ND Benzo (b) fluoranthene ND ND Benzo (ghi) perylene Benzo(k) fluoranthene ND ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene Indeno (1, 2, 3-cd) pyrene ND 1-Methylnaphthalene ND ND 2-Methylnaphthalene ND Naphthalene Phenanthrene ND ND Pyrene

ug/L) as rec'd (None Detected, lower detectable limit = 5 NOTE: ND ND* (None Detected, lower detectable limit = ug/L) as rec'd

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
•		WATER	SOLID
Nitrobenzene-d5	83	(22-135)	(10-155)
Fluorobiphenyl	73	(34-140)	(12-153)
Terphenyl-d14	29	(10-132)	(13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-24 MATRIX : WATER

SAMPLE ID : KYW-103-DUP1

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	120	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
Lead	4/12- 4/13/93	33	10	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-24 MATRIX : WATER

SAMPLE ID : KYW-103-DUP1

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/13- 4/15/93	1	1	mg/L



LAB #: 3C3011-25

MATRIX: WATER

DATE RECEIVED:

3/30/93 NA

DATE EXTRACTED:

4/7/93

DATE ANALYZED:

SAMPLE ID: KYW-103-DUP2

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS METHOD 602 - GC

HRS84297

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene Xylenes ND Methyl-tert-butylether 4

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND

ND*

(Not Analyzed) - -

ug/L) as rec'(ug/L) as rec'c

SURROGATE RECOVERY: Trifluorotoluene (PID) 99

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-25 MATRIX: WATER DATE RECEIVED: 3/30/93 DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/18/93

SAMPLE ID: KYW-103-DUP2

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo(b)fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a,h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND
- <u>-</u>	

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMIT	
		WATER	SOLID
Nitrobenzene-d5	89	(22-135)	(10-155)
Fluorobiphenyl	71	(34-140)	(12-153)
Terphenyl-d14	21	(10-132)	(13-140)



LAB #: 3C3011-25 MATRIX : WATER

SAMPLE ID : KYW-103-DUP2

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

	PREPARATION -		DETECTION	
ELEMENT	ANALYSIS DATE	RESULT	LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
ead	4/12- 4/13/93	ND	5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-25 MATRIX : WATER

SAMPLE ID : KYW-103-DUP2

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver	4/12/93	ND	50 ug/I
Arsenic	4/12- 4/14/93	ND	10 ug/I
Barium	4/12/93 4/12/93	ND	100 ug/I 10 ug/I
Chromium	4/12/93	ND	50 ug/I
Mercury	4/15/93	ND	2 ug/I
Lead	4/12- 4/13/93	ND	5 ug/I
Selenium	4/12- 4/13/93	ND	



LAB #: 3C3011-25 MATRIX : WATER

SAMPLE ID : KYW-103-DUP2

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION -PREPARATION ANALYSIS DATE RESULT LIMIT PARAMETER

Tot Recoverable Pet Hydrocarbons

4/13- 4/15/93

ND

1 mg/L



LAB #: 3C3011-26

MATRIX: WATER

DATE RECEIVED:

3/30/93

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 7/93

HRS84297

SAMPLE ID: KYW-103-DUP3

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

Benzene ND ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND Ethylbenzene ND Toluene ND ND Xylenes Methyl-tert-butylether

NOTE: ND (None Detected, lower detectable limit = 1

(None Detected, lower detectable limit = ND*

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

102

ACCEPTABLE LIMITS (73 - 131)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-26

DATE EXTRACTED: 4/ 1/93

MATRIX: WATER

DATE ANALYZED:

4/18/93

HRS84297

SAMPLE ID: KYW-103-DUP3

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS

METHOD 625 HSL/TCL LIST - GC/MS

Benzo (a) anthracene ND Benzo (a) pyrene ND Benzo (b) fluoranthene ND Benzo (ghi) perylene ND Benzo (k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND
Benzo (b) fluoranthene ND Benzo (ghi) perylene ND Benzo (k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND
Benzo(k) fluoranthene ND Chrysene ND Dibenz(a,h) anthracene ND Fluoranthene ND Fluorene ND
Thrysene ND Dibenz(a,h)anthracene ND Fluoranthene ND Fluorene ND
Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND
Fluoranthene ND Fluorene ND
Fluorene ND
1.202.0
Indeno(1,2,3-cd)pyrene ND
1-Methylnaphthalene 35
2-Methylnaphthalene ND
Naphthalene ND
Phenanthrene ND
Pyrene ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	*	ACCEPTABLE LIMITS WATER SOLID
Nitrobenzene-d5	75	(22-135) (10-155)
Fluorobiphenyl	69	(34-140) (12-153)
Terphenyl-d14	25	(10-132) (13-140)



DATE RECEIVED: 3/30/93

LAB #: 3C3011-26 MATRIX : WATER

SAMPLE ID : KYW-103-DUP3

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50 ug	/L
Arsenic	4/12- 4/14/93	ND	10 ug	
Barium	4/12/93	ND	100 ug	
Cadmium	4/12/93	ND	10 ug,	/L
Chromium	4/12/93	ND	50 ug,	
Mercury	4/15/93	ND	2 ug,	
Lead	4/12- 4/13/93	ND	5	/Ľ
Selenium	4/12- 4/13/93	ND	5 ug,	



LAB #: 3C3011-26 MATRIX : WATER

SAMPLE ID : KYW-103-DUP3

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

	PREPARATION -		DETECTION	
ELEMENT	ANALYSIS DATE	RESULT	LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND	10	ug/L
Barium	4/12/93	ND	100	ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND	. 50	ug/L
Mercury	4/15/93	ND	2	ug/L
Lead	4/12- 4/13/93	ND	5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



LAB #: 3C3011-26 MATRIX : WATER

SAMPLE ID : KYW-103-DUP3

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -ANALYSIS DATE RESULT DETECTION LIMIT PARAMETER Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 7 1 mg/L



DATE RECEIVED:

3/30/93

LAB #: 3C3011-27 MATRIX: WATER

DATE EXTRACTED:

NA

DATE ANALYZED:

4/ 7/93

HRS84297

ug/L) as rec'o

ug/L) as rec'c

SAMPLE ID: KYW-103-EB1

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

Benzene ND ND Chlorobenzene 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene Toluene ND ND Xylenes ND Methyl-tert-butylether

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = NOTE: ND ND*

(Not Analyzed)

ACCEPTABLE LIMITS

SURROGATE RECOVERY: Trifluorotoluene (PID)

95

(73 - 131)



LAB #: 3C3011-27

DATE RECEIVED: DATE EXTRACTED: 4/ 1/93

3/30/93

MATRIX: WATER

DATE ANALYZED:

4/18/93

SAMPLE ID: KYW-103-EB1

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	· ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo (a) pyrène	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
_	
Dibenz(a,h)anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno(1,2,3-cd)pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = NOTE: ND ug/L) as rec'd ND* ug/L) as rec'd (Not Analyzed)

SURROGATE RECOVERY:	*	ACCEPTABLE LIMITS		
		WATER	SOLID	
Nitrobenzene-d5	89	(22-135)	(10-155)	
Fluorobiphenyl	76	(34-140)	(12-153)	
Terphenyl-d14	59	(10-132)	(13-140)	



LAB #: 3C3011-27 MATRIX : WATER

SAMPLE ID : KYW-103-EB1

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver Arsenic	4/12/93 4/12- 4/14/93	ND	50	ug/L
Barium	4/12/93	ND ND	10 100	ug/L ug/L
Cadmium	4/12/93	ND	50	ug/L
Chromium	4/12/93	ND	50	ug/L
Mercury	4/15/93	ND	2	ug/L
_ead	4/12- 4/13/93	ND	5	ug/L
Selenium	4/12- 4/13/93	ND	5	ug/L



DATE RECEIVED: 3/30/93

LAB #: 3C3011-27 MATRIX : WATER

SAMPLE ID : KYW-103-EB1

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND

1 mg/L



LAB #: 3C3011-27 MATRIX : WATER

SAMPLE ID : KYW-103-EB1

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT

HRS84297

SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/I
Arsenic	4/12- 4/14/93	ND	10	ug/I
Barium	4/12/93	ND	100	ug/I
Cadmium	4/12/93	ND	10	ug/I
Chromium	4/12/93	ND	50	ug/I
Mercury	4/15/93	ND	2	ug/I
Lead	4/12- 4/13/93	ND	5.	ug/I
Selenium	4/12- 4/13/93	ND	5	ug/I

(None Detected) NOTE: ND



LAB #: 3C3011-28

DATE RECEIVED: DATE EXTRACTED:

3/30/93 NA

MATRIX: WATER

DATE ANALYZED: 4/7/93

HRS84297

ug/L) as rec'd

ug/L) as rec'd

SAMPLE ID: KYW-103-EB2

KEY WEST-CTO 7

CERTIFICATION #: E84059

VOLATILE ORGANICS

METHOD 602 - GC

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND

(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = ND*

(Not Analyzed)

SURROGATE RECOVERY: 94 Trifluorotoluene (PID)

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3011-28

MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/30/93 4/ 1/93

DATE ANALYZED:

4/18/93

HRS84297

SAMPLE ID: KYW-103-EB2

KEY WEST-CTO 7

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene ND Acenaphthylene ND Anthracene ND Benzo (a) anthracene ND Benzo(a)pyrene ND Benzo (b) fluoranthene ND Benzo (ghi) perylene ND Benzo(k) fluoranthene ND Chrysene ND Dibenz (a, h) anthracene ND Fluoranthene ND Fluorene ND Indeno (1, 2, 3-cd) pyrene ND 1-Methylnaphthalene ND 2-Methylnaphthalene ND Naphthalene ND Phenanthrene ND Pyrene ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd ND* (None Detected, lower detectable limit = ug/L) as rec'd -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	
Nitrobenzene-d5	90	(22-135)	(10-155)	
Fluorobiphenyl	78	(34-140)	(12-153)	
Terphenyl-d14	67	(10-132)	(13-140)	



LAB #: 3C3011-28 MATRIX : WATER

SAMPLE ID : KYW-103-EB2

KEY WEST-CTO 7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/12/93	ND	50	ug/L
Arsenic	4/12- 4/14/93	ND		ug/L
Barium	4/12/93	ND		ug/L
Cadmium	4/12/93	ND	10	ug/L
Chromium	4/12/93	ND		ug/L
Mercury	4/15/93	ND		ug/L
Lead	4/12- 4/13/93	ND	5	
Selenium	4/12- 4/13/93	ND	5	ug/L



LAB #: 3C3011-28 MATRIX : WATER

SAMPLE ID : KYW-103-EB2

KEY WEST-CTO 7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION ANALYSIS DATE RESULT PREPARATION -DETECTION LIMIT PARAMETER Tot Recoverable Pet Hydrocarbons 4/13-4/15/93 ND 1 mg/L



LAB #: 3C3109-9 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: NA

DATE ANALYZED: 4/6/93

SAMPLE ID: KYW-103-EB3

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS METHOD 602 - GC

Benzene	ND
Chlorobenzene	ND
1,2-Dichlorobenzene	ND
1,3-Dichlorobenzene	ND
1,4-Dichlorobenzene	ND
Ethylbenzene	ND
Toluene	ND
Xylenes	ND
Methyl-tert-butylether	ND

ND (None Detected, lower detectable limit = 1 ND* (None Detected, lower detectable limit = NOTE: ND

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

99

ACCEPTABLE LIMITS (73 - 131)



LAB #: 3C3109-9 MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: 4/ 1/93 DATE ANALYZED: 4/22/93

SAMPLE ID: KYW-103-EB3

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a) pyrene	ND
Benzo(b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k)fluoranthene	ND
Chrysene	ND
Dibenz(a,h)anthracene Fluoranthene Fluorene	ND ND
Indeno(1,2,3-cd)pyrene 1-Methylnaphthalene 2-Methylnaphthalene	ND ND
Naphthalene Phenanthrene Pyrene	ND ND

(None Detected, lower detectable limit = 5 (None Detected, lower detectable limit = ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER SOLID		
Nitrobenzene-d5	67	(22-135) (10-15	5)	
Fluorobiphenyl	57	(34-140) (12-15:	3)	
Terphenyl-d14	21	(10-132) (13-14)	0)	



LAB #: 3C3109-9 MATRIX : WATER

SAMPLE ID : KYW-103-EB3

KEY WEST CTO7

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Silver Arsenic	4/14- 4/15/93 4/14- 4/15/93	ND ND	50 ug/L 10 ug/L
Barium	4/14- 4/15/93	ND	100 ug/L
Cadmium	4/14- 4/15/93	ND	10 ug/L
Chromium	4/14- 4/15/93	ND	50 ug/L
Mercury	4/16- 4/17/93	ND	2 ug/L
Lead	4/14- 4/16/93	ND	ت ، 50
Selenium	4/14- 4/16/93	ND	ي 5



LAB #: 3C3109-9 MATRIX : WATER

SAMPLE ID : KYW-103-EB3

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

DETECTION PREPARATION - ANALYSIS DATE RESULT LIMIT PARAMETER ND 1 mg/L

Tot Recoverable Pet Hydrocarbons

4/19/93



LAB #: 3C3109-10 MATRIX: WATER DATE RECEIVED: DATE EXTRACTED: 3/31/95

DATE ANALYZED:

NA 4/6/93

SAMPLE ID: TRIP BLANK

KEY WEST CTO7

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS METHOD 602 - GC

Benzene ND Chlorobenzene ND 1,2-Dichlorobenzene ND ND 1,3-Dichlorobenzene 1,4-Dichlorobenzene ND ND Ethylbenzene ND Toluene Xylenes ND Methyl-tert-butylether ND

NOTE: ND (None Detected, lower detectable limit = 1

ND* (None Detected, lower detectable limit =

(Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

97

ACCEPTABLE LIMITS (73-131)



QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles Toluene 2-Butanone Acetone

Semi-volatiles Methylene chloride Dimethyl phthalate Diethly phthalate Di-n-butyl phthalate Butyl benzyl phthalate Bis (2-ethylhexyl) phthalate

<u>Metals</u> Calcium Magnesium Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY (cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD (C LIMITS RECOVERY
4,4'-DDT Benzene	0	95 86	112 93	16 8	22 20	66-119 39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.%		cep. method

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

- J indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).
- B indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.
- DIL indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



LAB #: 3C3109-BK MATRIX: WATER DATE RECEIVED: 3.

3/31/9₃ NA

DATE ANALYZED:

4/ 6/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

VOLATILE ORGANICS METHOD 602 - GC

ND Benzene ND Chlorobenzene 1,2-Dichlorobenzene ND 1,3-Dichlorobenzene ND 1,4-Dichlorobenzene ND Ethylbenzene ND ND Toluene ND Xylenes ND Methyl-tert-butylether

NOTE: ND (None Detected, lower detectable limit = 1 ND* (None Detected, lower detectable limit =

-- (Not Analyzed)

ug/L) as rec'd ug/L) as rec'd

SURROGATE RECOVERY: Trifluorotoluene (PID)

% 98 ACCEPTABLE LIMITS (73-131)



LAB #: 3C3109-BK MATRIX: WATER

DATE RECEIVED: 3/31/93 DATE EXTRACTED: DATE ANALYZED:

NA 4/ 9/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS

1,1-Dichloroethene ND ND* Acrolein ND* 1,2-Dichloroethene (Total) ND Acrylonitrile ND 1,2-Dichloropropane ND Benzene ND Bromodichloromethane cis-1,3-Dichloropropene ND trans-1,3-Dichloropropene ND Bromoform ND ND Ethylbenzene Bromomethane ND ND Methylene chloride Carbon tetrachloride ND 1,1,2,2-Tetrachloroethane ND Chlorobenzene ND Tetrachloroethene ND Chloroethane ND ND ND Toluene 2-Chloroethylvinyl ether 1,1,1-Trichloroethane ND Chloroform ND ND 1,1,2-Trichloroethane Chloromethane ND Trichloroethene ND Dibromochloromethane ND Trichlorofluoromethane ND 1,2-Dichlorobenzene ND Vinyl chloride ND ND 1,3-Dichlorobenzene Xylene (Total) ND 1,4-Dichlorobenzene ND ND 1,1-Dichloroethane ND · 1,2-Dichloroethane

NOTE:	J B	(None Detected, lower detectable limit = 1 ug/L) as re (None Detected, lower detectable limit = 10 ug/L) as re (None Detected, lower detectable limit = ug/L) as re (Detected, but below quantitation limit; estimated value) (Compound detected in method blank associated with this sample) (Not Analyzed)	ec'd
		(Not Analyzed)	

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
		WATER	SOLID	TOM FEART
1,2-Dichloroethane	107	(75-123)	(85-126)	(85-138)
Toluene-d8	103	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	96	(86-115)	(84-124)	(83-128)



LAB #: 3C3109-BK MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 3/31/93 NA

DATE ANALYZED:

4/10/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

Acrolein Acrylonitrile Benzene	ND* ND* ND	1,1-Dichloroethene 1,2-Dichloroethene(Total) 1,2-Dichloropropane	ND ND
Bromodichloromethane Bromoform Bromomethane	ND ND ND	cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene	ND ND
Carbon tetrachloride Chlorobenzene Chloroethane	ND ND ND	Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND
2-Chloroethylvinyl ether Chloroform Chloromethane	ND ND ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	ND ND
Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene	ND ND ND	Trichloroethene Trichlorofluoromethane Vinyl chloride	ND ND
1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane	ND ND	Xylene (Total)	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd ND** (None Detected, lower detectable limit = ug/L) as rec'd Ug/L) as r

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS		
		WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	98	(75-123)	(85-126)	(85-138)
Toluene-d8	101	(75-123)	(89-124)	(89 - 128)
Bromofluorobenzene	94	(86-115)	(84-124)	(83-128)



LAB #: 3C3109-BK

MATRIX: WATER

DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/ 1/93

DATE ANALYZED: 4/15/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo(a) anthracene	ND
Benzo(a)pyrene	ND
Benzo (b) fluoranthene	ND
Benzo(ghi)perylene	ND
Benzo(k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND

Naphthalene	ND
Phenanthrene	ND
- · · · · · · · ·	***

Indeno (1, 2, 3-cd) pyrene

1-Methylnaphthalene

2-Methylnaphthalene

Pyrene ND

NOTE:	ND*	(None Detected, (None Detected, (Not Analyzed)	lower detectable		ug/L) as rec'd ug/L) as rec'd
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SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	105	(22-135) (10-155)
Fluorobiphenyl	92	(34-140) (12-153)
Terphenyl-dl4	80	(10-132) (13-140)

ND

ND

ND



LAB #: 3C3109-BK

MATRIX: WATER

DATE RECEIVED:

3/31/93

DATE EXTRACTED: 4/2/93
DATE ANALYZED: 4/19/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (1 of 2)

3	177	Diberra/a blankhmagera	177
Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
B (1) 63	150	District white late	1770
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
Bis (2-Chioroisopropy) ether	ND	ridoranchene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	NTD	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	R	(Compound detected in method blank associated with this sample)

(Not Analyzed)



ENSECO-WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.

LAB #: 3C3109-BK MATRIX: WATER

DATE RECEIVED: 3/31/93
DATE EXTRACTED: 4/ 2/93

DATE ANALYZED: 4/19/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE:	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	98	(22-135) (10-155)
Fluorobiphenyl	79	(34-140) (12-153)
Terphenyl-d14	78	(10-132) (13-140)



LAB #: 3C3109-BK MATRIX: WATER

DATE RECEIVED: DATE EXTRACTED: 4/ 2/93

3/31/93

DATE ANALYZED:

4/19/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol	ND ND
2,4-Dimethylphenol 2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol 4-Nitrophenol Pentachlorophenol	ND ND*
Phenol 2,4,6-Trichlorophenol	ND ND

(None Detected, lower detectable limit = 10 NOTE: ND ug/L) as rec'd (None Detected, lower detectable limit = 50 ug/L) as rec'd ND* J (Detected, but below quantitation limit; estimated value)

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
		WATER	SOLID
2-Fluorophenol	81	(17-95)	(24-118)
Phenol-d5	89	(11-89)	(17-124)
2,4,6-Tribromophenol	48	(10-134)	(10-156)



DATE RECEIVED: 3/31/93

LAB #: 3C3109-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Silver	4/14- 4/15/93	ND	50 t	ug/L
Arsenic	4/14- 4/15/93	ND		ug/L
Barium	4/14- 4/15/93	ND		ug/L
Cadmium	4/14- 4/15/93	ND	10	ug/L
Chromium	4/14- 4/15/93	ND		ug/L
Mercury	4/16- 4/17/93	ND		ug/L
Lead	4/14- 4/16/93	ND	· 50 · ı	ug/L
Selenium	4/14- 4/16/93	ND		ug/L

NOTE: ND (None Detected)



DATE RECEIVED: 3/31/93

LAB #: 3C3109-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/19/93	ND	1	mg/L

NOTE: ND (None Detected)



MATRIX: WATER METHOD: 602

RUN ID: 1A4612/1B4612

DATE EXTRACTED: N/A
DATE ANALYZED: 04/06/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
Benzene Chlorobenzene Toluene	1A4612/1B4612	101 100 104	15 70-117 24 58-133 16 70-117	



MATRIX: WATER

METHOD: 624 RUN ID: DW088

DATE EXTRACTED: N/A
DATE ANALYZED: 04/09/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC	
1,1-Dichloroethene	DW088	91	40 56-133	
Trichloroethene		88	17 77-111	
Chlorobenzene		105	21 78-122	
Toluene		117	30 64-128	
Benzene		94	21 83-123	
Dichlorobromomethane		76	25 71-123	



MATRIX : WATER

METHOD: 624

RUN ID : DW104

DATE EXTRACTED: N/A
DATE ANALYZED: 04/10/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,1-Dichloroethene Trichloroethene	DW104	87 91	40 56-133 17 77-111
Chlorobenzene		103	21 78-122
Toluene		108	30 64-128
Benzene Dichlorobromomethane		92 77	21 83-123 25 71-123



LAB ID : LCS MATRIX : WATER

MATRIX: WATER
METHOD: 625
RUN ID: D0291

DATE EXTRACTED: 04/01/93 DATE ANALYZED: 04/15/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Naphthalene	D0291	70	43 10-139
1-Methylnaphthalene		70	48 10-150
Acenaphthene		65	29 45-130
Fluorene		78	24 37-133
Pyrene		71	41 20-144
Chrysene		61	45 15-152



MATRIX: WATER METHOD: 625

RUN ID : D0479

DATE EXTRACTED: 04/02/93 DATE ANALYZED: 04/19/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,4-Dichlorobenzene	D0479	76	29 17-104
N-Nitrosodi-n-propylamine		36	43 36-124
1,2,4 Trichlorobenzene		71	30 20-109
Acenaphthene		78	37 54-129
2,4-Dinitrotoluene		66	32 27-123
Pyrene		81	47 34-128



MATRIX : WATER

METHOD: 625 RUN ID: D0479 DATE EXTRACTED: 04/02/93 DATE ANALYZED: 04/19/93

COMPO	JND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Pheno	 L	D0479	98	45 17-108
2-Ch1	prophenol		73	37 10-118
	oro-3-methylpheno	1	60	48 23-121
	rophenol		139	56 10-142
	chlorophenol		73	49 10-128



LAB ID : 3C3109-1 MATRIX: WATER

METHOD: 625

RUN ID: D0548/D0549

DATE RECEIVED : 03/31/93 DATE PREPARED : 04/02/93 DATE ANALYZED : 04/21/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,4-Dichlorobenzene N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene Acenaphthene 2,4-Dinitrotoluene	D0548/D0549	76 30 77 84 60	76 26 77 85 57	0	20 16-56 29 40-127 15 27-65 24 57-104 22 22-81
Pyrene		85	85	0	30 58-148

* = Diluted Out



LAB ID : 3C3109-1 MATRIX : WATER

METHOD: 625

RUN ID: D0548/D0549

DATE RECEIVED : 03/31/93 DATE PREPARED : 04/02/93 DATE ANALYZED : 04/21/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol 2-Chlorophenol	D0548/D0549	102 80	113 81	10 1	23 15-97 21 17-89
4-Chloro-3-methylphenol 4-Nitrophenol		64 114	67 108	5 5	36 08-101 34 13-99
Pentachlorophenol		78	77	1	42 13-96

* = Diluted Out



MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	·
Arsenic (furnace)	04/14/93	04/15/93	90	38 53-131	LCS
Barium	04/14/93	04/15/93	101	19 78-117	
Cadmium	04/14/93	04/15/93	98	18 77-113	
Chromium	04/14/93	04/15/93	103	21 79-121	
Lead	04/14/93	04/16/93	102	47 40-136	
Mercury (vapor)	04/16/93	04/17/93	91	18 83-120	
Selenium (furnace)	04/16/93	04/16/93	94	38 54-130	
Silver	04/14/93	04/15/93	101	23 74-121	



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	04/19/93	04/19/93	84	24 75-124	LCS



LAB ID : 3C3109-2 MATRIX: WATER

METHOD: 625 RUN ID: D0554/D0555 DATE RECEIVED : 03/31/93 DATE PREPARED : 04/01/93 DATE ANALYZED : 04/22/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Naphthalene	D0554/D0555	62	64	3	23 25-97
1-Methylnaphthalene		58	66	13	24 48-101
Acenaphthene		58	65	11	24 57-104
Fluorene		58	66	13	28 34-118
Pyrene		48	57	17	30 58-148
Chrysene		50	54	8	36 48-118

* = Diluted Out



LAB ID : 3C3109-8

MATRIX: WATER

DATE RECEIVED : 03/31/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC 1	RPD	QC LIMITS RPD %REC	LAB ID
Arsenic (furnace)	04/14/93	04/15/93	49	49	0	19 80-119	3C3109-8
Barium	04/14/93	04/15/93	74	78	5	15 81-110	000103 0
Cadmium	04/14/93	04/15/93	78	78	ō	15 76-110	
Chromium	04/14/93	04/15/93	76	80	5	21 74-117	
Lead	04/14/93	04/16/93	76	79	4	21 68-125	
Mercury (vapor)	04/16/93	04/17/93	74	84	13	22 80-130	
Selenium (furnace)	04/14/93	04/16/93	*	*		20 76-116	
Silver	04/14/93	04/15/93	85	85	0	16 70-101	

* = Diluted out

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Cli	ent: ABB Project Name/Number: Kecy Liest CTC7
Sam	ples Received By: 25 - 31-93
Sam	Signature) 32.305 received toke accepted to the second toke accepted toke accepted to the second toke accepted to
Type	e of shipping container samples received in? WAL Cooler
	Client Cooler WAL Shipper Box Other
Any	*NO* responses or discrepancies should be explained in comments section.
	YES NO
1.	Were custody seals on shipping container(s) intact?
2.	Were custody papers properly included with samples?
3.	Were custody papers properly filled out (ink, signed, match labels)?
4.	Did all bottles arrive in good condition (unbroken)?
5.	Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?
6.	Were correct bottles used for the tests indicated?
7.	Were proper sample preservation techniques indicated?
8.	Were samples received within adequate holding time?
9.	Were all VOA bottles checked for the presence of air bubbles?
10.	Were samples in direct contact with wet ice?
11.	Were samples accepted into the laboratory?
	Cooler # Temp °C Cooler # Temp °C
	Cooler # Temp 4 °C Cooler # Temp 4 °C
Comm	=nes: Approximately half the vials have head space
*** <u>***</u>	

WADSWORTH/ALERT LABORATORIES Sampling, testing, mobile labs

Chain of Custody Record

(813) 621-0784 Fax (813) 623-6021

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610

Record	of	3_
# 08193	2	

Client:	•		F	Project Name / L	ocation .	21/ 1.	- ·			,					· 	_T	P	arameter		<u> </u>
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item #	Da	ate	Time	MATRIX	Sampl	le Location		1/ \$	A E	METALO	TAPH.			<i> </i>			_			
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6		1	3:30	1	T / * *	13- 13-16	1		1:	.1	3.4							Metals sa	nde unf	Hereo
7			13:40			3 - 11-41			1	7	1								/	
8			13:50	1-1	· ·	S - YILL			7	}	1									
9			13:30		No. 7		6		, /											
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11	1	/	14:30	1.1/		3-MW1 03-DUP		7	7	1	1									
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Repo	rt To:	\mathcal{Q}_{o}	ger Du	S#04		Transfer Number	Item Number(s)	Relin	quist	ned E	By / C	Comp	any		\	Acc	cepted By / Company	Date	Time
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5910 Breckenridge Pkwy. Suite H Tampa, FL 33610 Chain of C

(813) 621-0784 Fax (813) 623-6021 ydy Record

Record 2

3

06225

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Client:	Project	ct Name / L	ocation	R1-1 1	-, -)				-					Pa	aramete	r			
ABB-ES Sampler(s) ROSEX Do Item # Date		IATRIX	Project #: Key W.S.T Samp	CTO 7	23 N C CC TAIN	O. Of DN- IERS	FAH. 602	METALC	TRPH.	£08.	//		7/					Remarks	
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11		<u> </u>	KYW-1	03-MW		e 2	. 2	/	/				<u></u>						
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Report To: ROGER Additional Comments	Duri	han	7	Transfer Number	Item Number(s	s)	Relinq	uishe	ed By	/ Corr	npan	у		Acce	oted By	/ Compa	any	Date	Time
Additional Comments	: MTR	·,-	11.7	1		A.	28-1	15	12	100		-		,	J.	, -	$\int_{[0,1]A}$	3/4/1	18"
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WADSWORTH/ALERT LABORATORIES Sampling, tėsting, mobile labs

Chain of Custody Record

(813) 621-0784 Fax (813) 623-6021

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610 Record 3 of 3

06226

Client: Project Name / Location	71/117	T									P	Parameter	v= 1	
ABB-ES TRIMAN AMEX. Sampler(s) Project #: ROGER Durham Key L	DIPIGIOS lest CTG?	No. Of CON-	14	! /		7	1							
	ole Location	TAINERS	17 M .	METALS	TAPH					/			Remarks	
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	103-11108 103-111029	6		11	4		-							
	03-MW7	6	22		-									
	3-MW15	6	22		•									
	3- DUP3	6	22	1	1									8 (¹)
7					•									
8														
9														
10														
11														
	Total Containers	36e		1	Num	ber	of C	oole	ers i	n Sł	ipm	ent	Bailers	
Report To: ROGER Durham		nber(s)	Reline	quishe	ed B	y / Co	ompa	any			Acc	epted By / Company	Date	Time
ROGER Durham Additional Comments: INCLUDE MTBE W/602 ANAlysia	1		ABB.	-23	10	20						1	10/10/20	19.50
INCLUDE THIBE WY GOE	2					_	_)				? 		· !	
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WADSWORTH/ALI LABORATORIES Sampling, testing, mobile labs

-_4 OF 5

5910 Breckenridge Pkwy. , Suite H . Tampa, FL 33610

Chain of Curtody Record

(813) 621-0784 Fax (813) 623-6021

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Record		
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Client:	~ ~ ~		Project Name / L		71/10	~				•						P	arameter			
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WADSWORTH/ALERT
LABORATORIES
Sampling, testing, mobile labs

Chain of Custody Record

(813) 621-0784
Fax (813) 623-6021

(813) 621-0784 Fax (813) 623-6021

10092

Client:			Project Name / L					T										arameter			
Sample	3-55	17	RUMAN A	Project #: Key Wes	Bbg 10	3	No.	-	7		1 ,	7	_7	7	<u>-</u>	7	7	arameter			
	-	ham		Key LAS	t Am	7	Of CON-	1/	770	W							1			•	
liem	re Dur	11877	<u> </u>	1000	<i>(</i> <u> </u>		TAINERS	1 /	7)	s; /	, /								Remarks	
#	Date	Time	MATRIX	Samp	ple Location			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	₹	METALO	TAPH	E GB .			/			/			
3 1	12-30-93	10.00	H20	KYW-1	3-11W	12	6		2	1	1					-					
4 2		10:00	Ī	XVIN-10	3-//W	16	6	2	2	1	1										· · · · · · · · · · · · · · · · · · ·
5 3		10:15			03-MWI	7	la	Z	Z	1	1										
14		10:30		KYW-K	13-MW	13	6	2	7	1	1										
5	V	11:30	V	KYW-	Surface	9	6	Z	2	1	1										
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Additio	nal Comme	nts:	///		- Trumber			10	D /		7					 }	1	1			
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JUNE 10 1993
SAMPLING EVENT

5910 Breckenninge Parkway, Suite H 813-621-0784 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-134

TASK ORDER NUMBER: 35

NAS KEY WEST BLDG 103

Presented to:

ROGER DURHAM

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES
5910 BRECKENRIDGE PARKWAY, SUITE H
TAMPA, FLORIDA 33610

(813) 621-0784

Joanne Anderson Project Manager

Randall C. Grubbs Laboratory Director - Florida

July 14, 1993



INVOLVEMENT

This report summarizes the analytical results of the NAS Key West Bldg 103 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 11 June 1993, in accordance with documented sample acceptance procedures. The Total Petroleum Hydrocarbon and Total Organic Carbon analyses were performed by our N. Canton, Ohio facility, Lab #E87225. The Grain Size analysis was performed by Thorton Laboratories, Inc. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD

ORGANICS

Volatile Organics Extraction	** EPA Method 624	** SW846 Method 8240 ** SW846 Method 5030
Base/Neutral Acid Extractables Extraction	** EPA Method 625	** SW846 Method 8270 ** SW846 Method 3540
TDH by GC		** SW846 Method 8015 Mod.

METALS

Arsenic	**	EPA	Method	206.2	**	SW846	Method	7060
Cadmium	**	EPA	Method	200.7	**	SW846	Method	6010

Continued - Page 2

NOTE:	** Indicates usage of this method to obtain results for this report.
(D)	Indicates draft version of this method was used
EPA Methods	Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods	From 40CFR Part 136, published in Federal Register on October 26, 1984.

Test Methods for Evaluating Solid Waste Physical/Chemical SW846 Methods Methods, 3rd Edition, USEPA, 1986.
American Society for Testing and Materials.
NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977. ASTM Methods NIOSH Method



ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER

METHOD

Page 2 - Continued

METALS

Chromium Lead

** EPA Method 200.7 ** SW846 Method 6010 ** EPA Method 239.2 ** SW846 Method 7421

Digestion

** SW846 Method 3050

MISCELLANEOUS

Nitrate Nitrogen Ammonia Nitrogen Orthophosphate Total Kjeldhal Nitrogen Total Organic Carbon Tot. Rec. Petroleum Hydrocarbons Extraction

** EPA Method 353.3 ** EPA Method 350.2 ** EPA Method 365.2 ** SW846 Method 351.3 ** SW846 Method 9060 ** SW846 Method 9073 (D) ** SW846 Method 9071

NOTE:

** Indicates usage of this method to obtain results for this report.

(D) EPA Methods Indicates draft version of this method was used

Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982

Standard Methods for the Examination of Water and Waste-water, Std. Methods

Drinking Waters USEPA, 600/4-88/039, December, 1988.

USEPA Methods

APHA, 16th edition, 1985. From 40CFR Part 136, published in Federal Register on October

SW846 Methods

26, 1984. Test Methods for Evaluating Solid Waste Physical/Chemical

ASTM Methods

NIOSH Method

Methods, 3rd Edition, USEPA, 1986. American Society for Testing and Materials. NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



LAB #: 3F1117-1

MATRIX: WATER

DATE RECEIVED: 6/11/93
DATE EXTRACTED: NA
DATE ANALYZED: 6/14/93

SAMPLE ID: MW-31D

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATIIE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene (Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
Denzene	212		
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
	ND	Ethylbenzene	ND
Bromomethane	ND	Prul inenzene	ND
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
			ND
Chloroethane	ND	Tetrachloroethene	MD
		M - 1	177
2-Chloroethylvinyl ether	ND	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND .	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
1,5 Dichiolopenzene		12272 00000000	
1.4-Dichlorobenzene	ND	Xylene (Total)	ND
1,1-Dichloroethane	ND		
•			
1,2-Dichloroethane	ND		

NOTE:		(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = 10 (None Detected, lower detectable limit =	ug/L)	as	rec'd rec'd rec'd
	J	(Detected, but below quantitation limit; estimated			
	В	(Compound detected in method blank associated with	this samp	ple))
		(Not Analyzed)			

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS					
	•	WATER	SOLID	TOM TEAET			
1,2-Dichloroethane	110	(78-130)	(85-126)	(85-138)			
Toluene-d8	101	(78-130)	(89 - 124)	(89-128)			
Bromofluorobenzene	105	(81-117)	(84-124)	(83-128)			



LAB #: 3F1117-1

MATRIX: WATER

SAMPLE ID: MW-31D

DATE ANALYZED:

6/11/_ . DATE EXTRACTED: 6/14/93 6/21/93

HRS84297

CERTIFICATION #: E84059

DATE RECEIVED:

BASE/NEUTRAL -- FXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS (1 of 2)

NAS KEY WEST BLDG 103

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a) anthracene	ND	1,4-Dichlorobenzene	ND
		•	
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo (a) pyrene	ND	2,4-Dinitrotoluene	ND
benzo (a) pyrene		z, a-biniciocoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether	ND	Fluoranthene	ND
BIS(2°CHIOIOISOPIOPYI) ethei	ND	LIGOTANCHEMA	ND
Bis (2-Ethylhexyl) phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
Bucyl Denzyl puchatace	ND	nevacu1010parad1ene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND
CHTADEMA	ML.	THOSHO (T) \$12 GG/DATERS	747

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)

(Not Analyzed)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-1

DATE EXTRACTED: 6/14/93

MATRIX: WATER

DATE ANALYZED: 6/21/93

SAMPLE ID: MW-31D

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

BASE/NEUTRAL FXTRACTABLE ORGANICS

HRS84297

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone Naphthalene Nitrobenzene	ND ND
N-Nitrosodimethylamine N-Nitrosodiphenylamine N-Nitrosodi-n-propylamine	ND ND ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	ND ND ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit: estimated value)

(Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
Nitrobenzene-d5	72	(26-131) (10-155)
Fluorobiphenyl	64	(27-119) (12-153)
Terphenyl-d14	67	(10-165) (13-140)



LAB #: 3F1117-1 MATRIX: WATER

DATE RECEIVED: 6/11/53 DATE EXTRACTED:

6/14/93 DATE ANALYZED: 6/21/93

SAMPLE ID: MW-31D

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

HRS84297

4-Chloro-3-methylphenol 2-Chlorophenol	ND ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	
	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd J (Detected, but below quantitation limit; estimated value)

(Compound detected in method blank associated with this sample) В (Not Analyzed)

SURROGATE RECOVERY:	8	ACCEPTABLE WATER	LIMITS SOLID
2-Fluorophenol	60	(10-116)	(24-118)
Phenol-d6	65	(10-175)	(17 - 124)
2,4,6-Tribromophenol	54	(10-155)	(10-156)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-1 MATRIX : WATER

SAMPLE ID : MW-31D

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION F LIMIT		
Arsenic	6/21- 6/22/93	ND	10 ug/L		
Cadmium	6/21- 6/22/93	ND	10 ug/L		
Chromium	6/21- 6/22/93	ND	50 ug/L		
Lead	6/21- 6/22/93	ND	5 ug/L		



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/9

LAB #: 3F1117-1 MATRIX : WATER

SAMPLE ID : MW-31D

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -DETECTION PARAMETER RESULT ANALYSIS DATE LIMIT

Tot Recoverable Pet Hydrocarbons

6/15- 6/16/93

ND

1 mg/L



DATE RECEIVED:

6/11/93

LAB #: 3F1117-9 MATRIX: WATER

DATE EXTRACTED: DATE ANALYZED:

NA 6/14/93

SAMPLE ID: EQUIPMENT BLANK(H2O) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS

HRS84297

Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	1,2-Dichloroethene (Total)	ND
Benzene	ND	1,2-Dichloropropane	ND
	177	cis-1,3-Dichloropropene	ND
Bromodichloromethane	ND		
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene	ND
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
Chloroethane	ND	* * -	ND
CHIOIOechane	,	100240440404	
2-Chloroethylvinyl ether	ND	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
CHICIOMechane		2,2,2	
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
1,5 Dichiolobenzene			
1,4-Dichlorobenzene	ND	Xylene (Total)	ND
1,1-Dichloroethane	ND	-	
1,2-Dichloroethane	ND		
T' T - DTCHTOTOGCHUME	41~		

NOTE:		(None Detected, lower detectable limit = 1 (None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = (Detected, but below quantitation limit; estimated (Compound detected in method blank associated with	ug/L) ug/L) value)	as rec' as rec' as rec'
	B	(Compound detected in method blank associated with	this samp	bje)
		(Not Analyzed)		

SURROGATE RECOVERY:	%	ACCEPTABLE	E LIMITS	
		WATER	SOLID	TOM TEAET
1,2-Dichloroethane	109	(78-130)	(85-126)	(85-138)
Toluene-d8	102	(78-130)	(89-124)	(89-128)
Bromofluorobenzene	107	(81-117)	(84-124)	(83-128)



LAB #: 3F1117-9 MATRIX: WATER DATE RECEIVED: 6/11/ DATE EXTRACTED: 6/14/93 DATE ANALYZED: 6/21/93

SAMPLE ID: EQUIPMENT BLANK (H2O)

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL -- FXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene ND Dibenzo (a, h) anthracene ND Acenaphthylene ND Di-n-butyl phthalate ND Anthracene ND 1,2-Dichlorobenzene ND Benzidine ND* 1,3-Dichlorobenzene ND Benzo (a) anthracene ND 1,4-Dichlorobenzene ND Benzo (b) fluoranthene 3,3'-Dichlorobenzidine ND* ND Benzo(k) fluoranthene ND Diethyl phthalate ND Benzo (ghi) perylene ND Dimethyl phthalate ND ND 2,4-Dinitrotoluene ND Benzo (a) pyrene Bis (2-Chloroethoxy) methane ND 2.6-Dinitrotoluene ND Bis (2-Chloroethyl) ether Di-n-octyl phthalate ND ND Fluoranthene Bis (2-Chloroisopropyl) ether ND ND Bis (2-Ethylhexyl) phthalate ND Fluorene ND Hexachlorobenzene 4-Bromophenyl phenyl ether ND ND Butyl benzyl phthalate Hexachlorobutadiene ND ND 2-Chloronaphthalene ND Hexachlorocyclopentadiene ND 4-Chlorophenyl phenyl ether ND Hexachloroethane ND Chrysene ND Indeno (1, 2, 3-cd) pyrene ND

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	D	(Compound detected in method blank aggoriated with this sample)

(Compound detected in method blank associated with this sample)

-- (Not Analyzed)



DATE RECEIVED: 6/11/93

DATE EXTRACTED: 6/14/93

LAB #: 3F1117-9 MATRIX: WATER

Pyrene

DATE ANALYZED:

6/21/93

HRS84297

SAMPLE ID: EQUIPMENT BLANK (H2O)

NAS KEY WEST BLDG 103

CERTIFICATION #:

BASE/NEUTRAL EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS (2 of 2)

ND Isophorone ND Naphthalene Nitrobenzene ND N-Nitrosodimethylamine ND N-Nitrosodiphenylamine ND ND N-Nitrosodi-n-propylamine ND Phenanthrene ND

1,2,4-Trichlorobenzene

(None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = 50 ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Detected, but below quantitation limit: estimated value) J В

(Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
•		WATER	SOLID
Nitrobenzene-d5	86	(26-131)	(10-155)
Fluorobiphenyl	81	(27-119)	(12-153)
Terphenyl-d14	84	(10-165)	(13-140)

ND



SAMPLE ID: EQUIPMENT BLANK (H2O)

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.

LAB #: 3F1117-9 MATRIX: WATER DATE RECEIVED: 6/11, DATE EXTRACTED: 6/14/93 DATE ANALYZED: 6/21/93

MATRIX: WATER

DA.

NAS KEY WEST BLDG 103 CERTIFICATION #: E84059

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

HRS84297

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	, ND
- + +	
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd J (Detected, but below quantitation limit; estimated value)

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
2-Fluorophenol	72	WATER SOLID (10-116) (24-118)
Phenol-d6	77	(10-175) (17-124)
2,4,6-Tribromophenol	59	(10-155) (10-156)



DATE RECEIVED: 6/11/93

LAB #: 3F1117-9 MATRIX : WATER

SAMPLE ID : EQUIPMENT BLANK (H2O) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Arsenic	6/21- 6/22/93	ND	10 ug/L
Cadmium	6/21- 6/22/93	ND	10 ug/L
Chromium	6/21- 6/22/93	ND	50 ug/L
Lead	6/21- 6/22/93	ND	5 ug/L

(None Detected) NOTE: ND



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/

LAB #: 3F1117-9 MATRIX : WATER

SAMPLE ID : EQUIPMENT BLANK (H2O) NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION -ANALYSIS DATE RESULT DETECTION PARAMETER LIMIT Tot Recoverable Pet Hydrocarbons 6/15-6/16/93 ND 1 mg/L



LAB #: 3F1117-11

SAMPLE ID: TRIP BLANK

DATE RECEIVED: 6/11/93 DATE EXTRACTED: NA DATE ANALYZED: 6/14/93

MATRIX: WATER

NAS KEY WEST BLDG 103

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 624 - GC/MS HRS84297

Acrolein Acrylonitrile Benzene	ND* ND* ND	1,1-Dichloroethene 1,2-Dichloroethene(Total) 1,2-Dichloropropane	ND ND
Bromodichloromethane Bromoform Bromomethane	ND ND ND	<pre>cis-1,3-Dichloropropene trans-1,3-Dichloropropene Ethylbenzene</pre>	ND ND
Carbon tetrachloride Chlorobenzene Chloroethane	ND ND	Methylene chloride 1,1,2,2-Tetrachloroethane Tetrachloroethene	ND ND ND
2-Chloroethylvinyl ether Chloroform Chloromethane	ND ND ND	Toluene 1,1,1-Trichloroethane 1,1,2-Trichloroethane	ND ND ND
Dibromochloromethane 1,2-Dichlorobenzene 1,3-Dichlorobenzene	ND ND ND	Trichloroethene Trichlorofluoromethane Vinyl chloride	ND ND
1,4-Dichlorobenzene 1,1-Dichloroethane 1,2-Dichloroethane	ND ND ND	Xylene (Total)	ND

NOTE:		(None Detected, lower detectable limit = 1 ug/L) as rec' (None Detected, lower detectable limit = 10 ug/L) as rec' (None Detected, lower detectable limit = ug/L) as rec'
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABL	E LIMITS	
	-	WATER	SOLID	TOM TEAET
1.2-Dichloroethane	110	(78-130)	(85-126)	(85-138)
Toluene-d8	100	(78-130)	(89-124)	(89-128)
Bromofluorobenzene	106	(81-117)	(84-124)	(83-128)



QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles Toluene 2-Butanone Acetone

Semi-volatiles Methylene chloride Dimethyl phthalate Diethly phthalate Di-n-butyl phthalate Butyl benzyl phthalate Bis (2-ethylhexyl) phthalate

Metals Calcium Magnesium Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



QUALITY ASSURANCE / QUALITY CONTROL PROGRAM SUMMARY (cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT Benzene	0 10	95 86	112 93	16 8	22 20	66-119 39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		cep. method rform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

- J indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).
- B indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.
- DIL indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



LAB #: 3F1117-BK MATRIX: WATER

DATE RECEIVED: 6/11/93
DATE EXTRACTED: NA
DATE ANALYZED: 6/14/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

HRS84297

Acrolein Acrylonitrile	ND*	1,1-Dichloroethene 1,2-Dichloroethene(Total)	ND ND
Benzene	ND	1,2-Dichloropropane	ND
		1,1 Didalolopiopano	
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene	ND
Carbon tetrachloride	ND	Methylene chloride	ND
Chlorobenzene	ND	1,1,2,2-Tetrachloroethane	ND
Chloroethane	ND	Tetrachloroethene	ND.
	· ·		
2-Chloroethylvinyl ether	ND	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
·		-	
1,4-Dichlorobenzene	ND	Xylene(Total)	ND
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND .		

NOTE:	ND	(None Detected, lower detectable limit = 1 ug/L) as rec'	
	ND*	(None Detected, lower detectable limit = 10 ug/L) as rec'	
	ND**	(None Detected, lower detectable limit = ug/L) as rec'	
	J	(Detected, but below quantitation limit; estimated value)	
	В	(Compound detected in method blank associated with this sample)	
	:	(Not Analyzed)	

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	FOM FEAET
1,2-Dichloroethane	111	(78-130)	(85-126)	(85-138)
Toluene-d8	101	(78-130)	(89-124)	(89-128)
Bromofluorobenzene	108	(81-117)	(84-124)	(83-128)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED:

6/11/__ NA

DATE EXTRACTED: DATE ANALYZED:

6/15/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

VOLATILE ORGANICS USEPA METHOD 8240 - GC/MS

HRS84297

Acetone Benzene Bromodichloromethane	ND**	cis-1,3-Dichloropropene trans-1,3-dichloropropene	
bromodichioromethane	ND	Ethylbenzene	ND
Bromoform	ND	2-Hexanone	ND**
Bromomethane	ND	Methylene chloride	ND
2-Butanone	ND**	4-Methyl-2-pentanone	ND**
Carbon disulfide	ND	Styrene	ND
Carbon tetrachloride	ND	1,1,2,2-Tetrachloroethane	ND
Chlorobenzene	ND	Tetrachloroethene	ND
	*		
Chlorodibromomethane	ND '	Toluene	ND
Chloroethane	ND	1,1,1-Trichloroethane	ND
Chloroform	ND	1,1,2-Trichloroethane	ND
Chloromethane	ND	Trichloroethene	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
1,2-Dichloroethane	ИD	Xylene (Total)	ND
•			
1,1-Dichloroethene	ND		
1,2-Dichloroethene(Total)	ND		
1,2-Dichloropropane	ND		

NOTE:		(None Detected, lower detectable limit = 1 ug/L) as red
	ND*	(None Detected, lower detectable limit = ug/L) as red
	ND**	(None Detected, lower detectable limit = 10 ug/L) as rec
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS	
		WATER	SOLID	TOM TEART
1,2-Dichloroethane	124	(78-130)	(85-126)	(85-138)
Toluene-d8	107	(90-109)	(89 - 124)	(89-128)
Bromofluorobenzene	105	(81-117)	(84 - 124)	(83-128)



LAB #: 3F1117-BK MATRIX: WATER

DATE RECEIVED: 6/11/93 DATE EXTRACTED: 6/14/93 DATE ANALYZED: 6/21/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL -- FXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ИD
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis (2-Chloroethoxy) methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether		Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND
and a and			

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Note Amplement)

(Not Analyzed)



DATE RECEIVED: 6/11/5

DATE EXTRACTED:

6/14/93

LAB #: 3F1117-BK MATRIX: WATER

DATE ANALYZED:

6/21/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

BASE/NEUTRAL FXTRACTABLE ORGANICS

USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

(None Detected, lower detectable limit = 10 (None Detected, lower detectable limit = 50 ug/L) as rec'd NOTE: ND ug/L) as rec'd ND* (Detected, but below quantitation limit: estimated value) J

В (Compound detected in method blank associated with this sample)

(Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE	LIMITS
	•	WATER	SOLID
Nitrobenzene-d5	69	(26-131)	(10-155)
Fluorobiphenyl	62	(27-119)	(12-153)
Terphenyl-d14	78	(10-165)	(13-140)



LAB #: 3F1117-BK MATRIX: WATER

DATE EXTRACTED: 6/14/93

DATE RECEIVED: 6/11/93

DATE ANALYZED: 6/21/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ACID EXTRACTABLE ORGANICS USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol 2-Chlorophenol 2,4-Dichlorophenol		ND ND ND
2,4-Dimethylphenol		ND*
2,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol		ND*
2-Nitrophenol		ND
4-Nitrophenol		ND*
Pentachlorophenol		ND*
Phenol	• *	ND
2,4,6-Trichlorophenol		ND
2,4,6-ILICHIOLOPHENOI		

NOTE:	ND	(None Detected, lower detectable limit = 10 ug/L) as rec'd
	ND*	(None Detected, lower detectable limit = 50 ug/L) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	В	(Compound detected in method blank associated with this sample)
		(Not Analyzed)

SURROGATE RECOVERY:	· %	ACCEPTABLE	LIMITS
		WATER	SOLID
2-Fluorophenol	54	(10-116)	(24-118)
Phenol-d6	61,	(10-175)	(17-124)
2.4.6-Tribromophenol	59	(10-155)	(10-156)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED: 6/11/ DATE EXTRACTED: 6/15/93

DATE ANALYZED:

6/22/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS (1 of 2)

HRS84297

Acenaphthene	ND	Dibenzo (a, h) anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo (a) anthracene	ND	1,4-Dichlorobenzene	ND
Benzo (b) fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k) fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a) pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis (2-Chloroethyl) ether	ND	Di-n-octyl phthalate	ND
Bis (2-Chloroisopropyl) ether		Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
		Hexachlorobutadiene	
Butyl benzyl phthalate	ND	hexachiorobucadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ИD

NOTE:	ND	(None Detected, lower detectable limit = 0.33 mg/kg) as rec'd
	ND*	(None Detected, lower detectable limit = 1.7 mg/kg) as rec'd
	J	(Detected, but below quantitation limit; estimated value)
	R	(Compound detected in method blank associated with this sample)

(Not Analyzed)



DATE RECEIVED: 6/11/93

DATE EXTRACTED: 6/15/93

LAB #: 3F1117-BK MATRIX: SOIL

DATE ANALYZED: 6/22/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059 HRS84297

BASE/NEUTRAL FXTRACTABLE ORGANICS

USEPA METHOD 8270 - GC/MS (2 of 2)

Isophorone	ИD
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene Pyrene 1,2,4-Trichlorobenzene	ND ND

(None Detected, lower detectable limit = 0.33 (None Detected, lower detectable limit = 1.7 ND mg/kg) as rec'd NOTE: mg/kg) as rec'd ND* (Detected, but below quantitation limit: estimated value) J

(Compound detected in method blank associated with this sample) В

(Not Analyzed)

%	ACCEPTABLE	LIMITS
	WATER	SOLID
91	(22-135)	(10-155)
82	(34-140)	(12-153)
86	(10-132)	(13-140)
	91 82	WATER 91 (22-135) 82 (34-140)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED: 6/11, DATE EXTRACTED: 6/15/93

DATE EXTRACTED: 6/15/93 DATE ANALYZED: 6/22/93

SAMPLE ID: LABORATORY BLANK

ACID EXTRACTABLE ORGANICS USEPA METHOD 8270 - GC/MS

CERTIFICATION #: E84059

HRS84297

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 0.33 mg/kg) as rec'd ND* (None Detected, lower detectable limit = 1.7 mg/kg) as rec'd J (Detected, but below quantitation limit; estimated value)

B (Compound detected in method blank associated with this sample)

-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
		WATER SOLID
2-Fluorophenol	81	(10-116) (24-118)
Phenol-d6	89	(10-175) (17-124)
2,4,6-Tribromophenol	82	(10-155) (10-156)



LAB #: 3F1117-BK

MATRIX: SOIL

DATE RECEIVED:

6/11/93 DATE EXTRACTED: 6/16/93

DATE ANALYZED: 6/18/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

DETECTION RESULT (mg/kg) LIMIT

PARAMETER

ND TPH (Extractable) -GC

10

(None Detected) as rec'd NOTE: ND (Detected, but below quantitation limit; estimated value) J



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Arsenic Cadmium	6/21- 6/22/93 6/21- 6/22/93	ND ND	10 ug/ 10 ug/
Chromium	6/21- 6/22/93	ND	50 ug/
Lead	6/21- 6/22/93	ND	5 ug/



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/93

LAB #: 3F1117-BK MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic Cadmium Chromium	6/21/93 6/21/93 6/21/93	ND ND ND	0.01 0.01 0.05	mg/L mg/L mg/L
Lead	6/21/93	ND	0.05	mg/L

(None Detected) NOTE: ND



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/9:

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	٠
Tot Pecoverable Pet Hydrocarbons	6/15- 6/16/93	ND	1	mg/L



DATE RECEIVED: 6/11/93

LAB #: 3F1117-BK MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PREPARATION - DETECTION ANALYSIS DATE RESULT LIMIT

Tot Recoverable Pet Hydrocarbons 6/15-6/16/93 ND 1 mg/L



COMPANY: ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 6/11/9

LAB #: 3F1117-BK MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTI LIMIT	ON
Ammonia Nitrogen	6/24/93	ND	0.5	mg/L
Nitrate-Nitrite Nitrogen	6/28/93	ND	0.05	mg/L
Phosphate Phosphorus	6/28/93	ND	0.10	mg/L
Total Kjeldahl Nitrogen	6/24/93	ND	0.5	mg/L
Total Organic Carbon	7/ 1/93	ND	50	mg/kg
Tot Recoverable Pet Hydrocarbons	6/15- 6/16/93	ИD	. 5	mg/kg



LAB ID : LCS

MATRIX: WATER METHOD: 624

RUN ID : FW081

DATE EXTRACTED: N/A

DATE ANALYZED: 06/14/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,1-Dichloroethene	FW081	113	41 62-143
Benzene		111	19 80-119
Trichloroethene		113	18 76-113
Dichlorobromomethane		110	29 64-122
Toluene		111	18 81-117
Chlorobenzene		111	19 73-111



LAB ID : LCS

MATRIX : SOIL

METHOD: 8240 RUN ID: FS108 DATE EXTRACTED: N/A

DATE ANALYZED: 06/15/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
1,1-Dichloroethene	FS108	129	50 52-152
Benzene	•	115	21 78-120
Trichloroethene		93	19 73-112
Dichlorobromomethane		102	33 57-123
Toluene		110	18 80-117
Chlorobenzene		97	14 75-103



LAB ID : LCS MATRIX : WATER METHOD : 625 RUN ID : F0364

DATE EXTRACTED: 06/14/93 DATE ANALYZED: 06/21/93

СОМЪОПИД	ANALYTICAL	LCS	QC LIMITS
	RUN ID #	%REC	RPD %REC
1,4-Dichlorobenzene N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene Acenaphthene 2,4-Dinitrotoluene Pyrene	F0364	84 90 69 126 79 91	45 19-108 43 38-123 52 15-119 42 51-136 45 26-117 55 28-138



LAB ID : LCS MATRIX : WATER

METHOD: 625 RUN ID: F0364 DATE EXTRACTED: 06/14/93 DATE ANALYZED: 06/21/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Phenol	F0364	70	49 15-112
2-Chlorophenol		69	45 19-109
4-Chloro-3-methylphenol		70	47 27-120
4-Nitrophenol		5 9	54 10-113
Pentachlorophenol		37	47 10-104



LAB ID : LCS MATRIX : SOIL METHOD : 8270 RUN ID : F0388

DATE EXTRACTED: 06/15/93 DATE ANALYZED: 06/22/93

COMPOUND	ANALYTICAL	LCS	QC LIMITS
	RUN ID #	%REC	RPD %REC
1,4-Dichlorobenzene N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene	F0388	96 83 79	42 31-115 52 31-137 47 29-123
Acenaphthene		77	57 41-155
2,4-Dinitrotoluene		74	52 22-127
Pyrene		82	63 15-142



LAB ID : LCS

MATRIX : SOIL METHOD: 8270

RUN ID : F0388 DATE EXTRACTED: 06/15/93 DATE ANALYZED: 06/22/93

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Phenol	F0388	68	44 26-115
2-Chlorophenol		73	53 14-120
4-Chloro-3-methylphenol		76	43 35-121
4-Nitrophenol		85	59 16-135
Pentachlorophenol		42	57 10-123



DATE EXTRACTED: 06/16/93 DATE ANALYZED: 06/18/93

LAB ID: LCS
MATRIX: SOLID
METHOD: 8015 Mod.

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND

LCS

QC LIMITS

%REC

Total Petroleum Hydrocarbons 54

38-120



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic (furnace)	06/21/93	06/22/93	90	24 71-119	LCS
Cadmium	06/21/93	06/22/93	103	17 80-113	
Chromium	06/21/93	06/22/93	103	20 79-120	
Lead (furnace)	06/21/93	06/22/23	101	28 70-126	



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Arsenic furnace		06/21/93 06/21/93	85 86	22 68-111 18 71-106	LC
Chromium	06/21/93	06/21/93	93	22 71-114	
Lead	06/21/93	06/21/93	89	21 72-114	



LAB ID: LCS MATRIX: WATER DATE PREPARED: 07/01/93
DATE ANALYZED: 07/01/93

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	LCS % REC	QC LIMITS & REC
Total Organic Carbon	102	82_120



MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR) TRPH (IR)	06/15/93 06/15/93	06/16/93 06/16/93	95 94	24 75-123 24 75-123	LCS



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Ammonia Nitrogen Total Kjeldahl Nitrogen	06/24/93 06/24/93	06/24/93 06/24/93	104 109	16 86-119 10 92-109	LC
Phosphate Phosphorus Nitrate Nitrogen	06/28/93 06/28/93	06/28/93 06/28/93	89 100	30 66-126 21 76-119	



MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)		06/16/93	92	35 56-125	LC



LAB ID : 3F1117-8

DATE RECEIVED: 06/11/93

MATRIX : SOIL

METHOD: 8240

DATE PREPARED: N/A
DATE ANALYZED: 06/15/93

RUN ID : FS112/FS113

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,1-Dichloroethene Benzene Trichloroethene Toluene Dichlorobromomethane Chlorobenzene	FS112/FS113	143 118 149 114 97 103	146 124 160 120 101 108	2 5 7 5 4 5	28 60-145 13 87-114 19 64-103 12 85-109 21 67-111 21 72-115



LAB ID : 3E1117-1 MATRIX : WATER METHOD : 625 RUN ID : F0369/F0370

DATE RECEIVED: 06/11/93 DATE PREPARED: 06/14/93 DATE ANALYZED: 06/22/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,4-Dichlorobenzene N-Nitrosodi-n-propylamine 1,2,4 Trichlorobenzene Acenaphthene 2,4-Dinitrotoluene Pyrene	F0369/F0370	87 91 76 127 88	92 93 81 123 87	6 2 6 3 1	20 16-56 29 40-127 15 27-65 24 57-104 22 22-81 30 58-148



LAB ID : 3F1117-1 MATRIX : WATER METHOD : 625 RUN ID : F0369/F0370

DATE RECEIVED: 06/11/93
DATE PREPARED: 06/14/93
DATE ANALYZED: 06/22/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol 2-Chlorophenol	F0369/F0370	73 73	74 75	1 3	23 15-97 21 17-89
4-Chloro-3-methylphenol 4-Nitrophenol Pentachlorophenol		73 93 48	74 88 48	6 0	36 08-101 34 13-99 42 13-96



LAB ID : 3F1117-8
MATRIX : SOIL
METHOD : 8270
RUN ID : F0408

DATE RECEIVED: 06/11/93
DATE PREPARED: 06/15/93
DATE ANALYZED: 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
1,4-Dichlorobenzene	F0408	100	110	10	43 20-132
N-Nitrosodi-n-propylamine		82	88	7	44 25-114
1,2,4 Trichlorobenzene		87	90	3	24 38-136
Acenaphthene		120	123	2	22 34-122
2,4-Dinitrotoluene		79	83	5	41 10-119
Pyrene		85	89	5	26 38-141

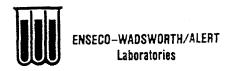


LAB ID : 3F1117-8
MATRIX : SOIL
METHOD : 8270
RUN ID : F0408

DATE RECEIVED: 06/11/93 DATE PREPARED: 06/15/93 DATE ANALYZED: 06/23/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

СОМРОИИД	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Phenol 2-Chlorophenol	F0408	62 58	74 78	18 29	24 15-112 29 19-100
4-Chloro-3-methylphenol		7 7	79	- 3	35 29-101
4-Nitrophenol		3	39	171	58 10-147
Pentachlorophenol		1	18	179	39 10-112



LAB ID : 3F1117-2

DATE RECEIVED : 06/11/93

MATRIX: WATER

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED		02.20	QC LIMITS RPD %REC	LAB ID
TRPH (IR)		06/16/93	115			3F1117-2

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Clie	ent: AB Project Name/Number: Bldg 10	3 ;
Samp	ples Received By: MAN Date Received: (0-11-93	
Samp	cle Evaluation Form By: (Signature) LAB No: 714/3F1	117
Type	of shipping container samples received in? WAL Cooler	
	Client Cooler WAL Shipper Box Other	<u></u>
Апу	"NO" responses or discrepancies should be explained in comments section.	•
	YES	NO
1.	Were custody seals on shipping container(s) intact?	
2.	Were custody papers properly included with samples?	
3.	Were custody papers properly filled out (ink, signed, match labels)?	
4.	Did all bottles arrive in good condition (unbroken)?	
5.	Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	
6.	Were correct bottles used for the tests indicated?	
7.	Were proper sample preservation techniques indicated?	
8.	Were samples received within adequate holding time?	
9.	Were all VOA bottles checked for the presence of air bubbles?	
10.	Were samples in direct contact with wet ice?	
11.	Were samples accepted into the laboratory?	
	Cooler # <u>B91</u> Temp 8 °C Cooler # <u>B50</u> Temp <u>5°C</u> °C	
	Cooler # £30 Temp 5 °C Cooler # £407 Temp 5 °C	
Comm	ents: COLOR, DO received out of hold time.	

SWORTH/ALERT DRATORIES Sampling, testing, mobile labs

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610

Chain of Custody Hecord (813) 623-6021 (813) 621-0784 Fax (813) 623-6021

Record	of	
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Date	Time	MATRIX				TAINERS		HA	A FEET AND A SECOND SEC	TAPH	F. B. P.	(7/2)		3/24				Hemarks	
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WADSWORTH/ALERT LABORATORIES Sampling, testing, mobile labs

5910 Breckenridge Pkwy. Suite H Tampa, FL 33610

Chain of Custody Record

(813) 621-0784 Fax (813) 623-6021

Recor	d	of	
#	10579	}	

Project Name / Location APA -1-Parameter Mrs ' ay west No. Project #: Sampler(s) Of 540 F 103 CON-**TAINERS** METALS. Remarks PAH TAPH Item **MATRIX** Sample Location EDB. Date Time 134 11.0 Hed permed 3 TRIP SIANK 2 3 9 10 11 Total **Number of Coolers in Shipment Bailers** Containers Report To: Rich Dut m Transfer Item Relinquished By / Company Accepted By / Company Date Number(s) Number **Additional Comments:** 1 2 3 4 5 6 Original Acco. Janies Shipment

APPENDIX D LITHOLOGIC LOGS

CLIENT: SOUTHNAVFACENG	SCOM		LOG of WELL: + / w = 103 = 4			NG NO. 5815 ECT NO: 7519-30		
CONTRACTOR: Groundwater		on Inc.	DATE STARTED:	3/23/93		COMPLTD: 3, 23	, a3	
METHOD: 4.25" HSA		CASE SIZE: 2 Inch	SCREEN INT.: 4	- 14 FT.				
TOC ELEV.: '2.51 FT.		MONITOR INST.: OVA	DPTH	TO 7 7.28 FT.				
LOGGED BY: R. Durham		WELL DEVELOPMENT DA	TE: 3/24/93			Blag. 103, Power P	"ant	
DEPTH F L F COLOTAVAGENT COLOTAVAGENT SAMPLE SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DE AND COMI		LITHOLUGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA	
	0 5	FILL: brown-gray, clayey sa	and mixed with limerock					
5	460	CLAY: brown-gray, sandy mi	xed with limerock					
	80							
10		SAND: light tan, silty, limey,	petroleum odor					
:5—								
20—		·	of 103-MW16 AB			TAL SERVICES		

TITLE: NAS Key West, Truman Annex	LOG	of WELL: * * # - 103 - 4#		BCR	ING NO. SBIG	
CLIENT: SOUTHNAVEACENGOOM				PRO	JECT NO: 7519-30	
CONTRACTOR: Groundwater Protection	Inc.	DATE STARTED: 3	/24/93	-	COMPLIE: 3/24	- 93
METHOD: 4.25° HSA	CASE SIZE: 2 inch	SCREEN INT.: 4 -	'4 FT.	PROT	ECTION LEVEL: 3	Y'''
TOC ELEV.: 12.69 FT.	MONITOR INST.: GVA	TOT OPTH: 14FT.		DPTH	TO I 7.49 FT	
LOGGED BY: R. Durnam	WELL DEVELOPMENT DATE: 3	J 25/93		SITE	: B-dg. 103, Power P	'art
DEPTH FT FT SAMPLE SAMPLE COVERY HEADSPACE	, SCIL/ROC/ DESCRIP AND COMMENTS		STMBOLUGIC	SOIL CLASS	810 x 8/8-0-	WELL 1741A
5— 2 SA:	ND: light brown, silty, mixed with	d with limerock and				
15—						
20—	PAGE 1.0f 10				TAL SERVICES	

TITLE: MAS key west. Truc	man, Annex	L	.0G of WELL: < + x = 103 = 4	lw18	BORI	NG NO. 8527	
CLIENT: SQUTHNAVFACEN	GCOM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwater		Inc.	DATE STARTED:	3/14/93		COMPLTD: 3 24	43
METHOD: 4.25° HSA		CASE SIZE: 2 inch	SCREEN INT.: 4	- 4 = -	PROTE	CTION LEVEL: 3	
TOC ELEV.: 11.67 FT.		MONITOR INST.: OVA	TOT DPTH: 14FT		OPTH	TO 7 6.82 FT.	
LOGGED BY: R. Durham		WELL DEVELOPMENT DA	TE: 3/24/93		SITE:	Blag. 103, Power P	ant
SAMPLE SAMPLE SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DES AND COMM		LTHULOGIC SYMBOL	SOIL CLASS	3LONS/6-IN	WELL DATA
5	0 0 5 A	ND: light brown, silty, mixed erock	with fill material and				
10—	1 1	• NND: light gray, very fine to erock	silty, mixed with				
15—							<u> </u>
20—							

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TITLE: NAS Key West, Trumer	n, Ann	e. LOG	of WELL: KIN-103-	мија	BOR:	ING NO. SELS	
CLIENT: SOUTHNAVFACENGO	ОМ				PRO	IECT NO: 7519-30	
CONTRACTOR: Groundwater P	rotec	tion Inc.	DATE STARTED:	: 3/24/93		COMPLTD: 3/04	¥3
METHOD: 4.25" HSA		CASE SIZE: 2 inch	SCREEN INT.: 4	1 - 14 FT.	PROTI	ECTION LEVEL: 0	
TOC ELEV.: 11.24 FT.		MONITOR INST.: 0V4	TOT DPTH: 14FT		DPTH	TO I 6.44 FT	
LOGGED BY: R. Durham		WELL DEVELOPMENT DATE:	3/25/93		SITE:	Bidg. 103 Power P	ar.
DEPTH F J. C.	HEADSPACE (ppm)	, SOIL/ROCK DESCRI AND SOMMENT		LTTHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WE 11 () A LA
10—	0 0	SAND: light brown, silty, mixed with limerock SAND, very light gray, very fine-grained with limerock, petroleum odo	rained to silty.				
20—		PAGE 1 of 103	- <u>MW19 ABB</u>	ENVIRON	IMENT	AL SERVICES.	INC.

TITLE: NAS Key West, Truman Annex	1	LOG of WELL: KYW-103-MW	1201	BUNI	NG NO. SB29	
LIENT: SOUTHNAVFACENGCOM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwater Protectio	n Inc.	DATE STARTED: 3	/25/93		COMPLTD: 3/25	/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 25	-30 FT.	PROTE	CTION LEVEL: D	
OC ELEV.: 10.66 FT.	MONITOR INST.: OVA	TOT DPTH: 30FT.		DPTH	TO ♀ 5.85 FT.	
OGGED BY: R. Durham	WELL DEVELOPMENT DA	TE: 3/25/93		SITE:	Bldg. 103, Power F	lant
DEPTH FT. SAMPLE SAMPLE RECOVERY HEADSPACE (ppm)	SOIL/ROCK DE AND COMM		LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5— 0 0 0 5	IAND: brown-gray, silty, mixe	ed with limestone				
15—	SAND: tan, very fine-grained and shell fragments, creosot	d to silty, mixed with wood e odor	V V V V V V V V V V V V V V V V V V V		12,13,14,11	
14/24			V V V V V V V V V V V V V V V V V V V		13,18,28,35	
25—————————————————————————————————————			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
	LIMESTONE: gray, sandy, co strong creosote odor	oral and shell fragments,				

TOT DETH. 1457 DOTH TOT 2133 FT LOGGED BY: A Durran WELL DEVELOPMENT DATE: 3/25/23 SITE: 8-13/13, Pawer-Pawer BY: A Durran WELL DEVELOPMENT DATE: 3/25/23 SITE: 8-13/13, Pawer-Pawer BY:	TITLE: MAS Key West, Trums	J., 4		LOG of WELL:	s rw=103=M	wo!	BOP	ING NO. SB30	
SAND: prown-gray, safty, Fixed with interests SAND: prown-gray safty, Fixed with interests SAND: pro	CLIENT: SOUTHNAVFACENG	СОМ					PRO	JECT NO: 7519-30	
TOC SLEV. 1212 CT. MONITOR INST. 12.4 TOT CPTH (SPT OPTH TO 1 13 25 CT) MELL DEVELOPMENT DATE: 3:25.92 SITE Bigs (3) Foxer Date: 3:25.92 SOLL/ROCA DESCRIPTION AND COMMENTS SAND: Shown-gray, Mity, rived with intereck SAND: Shown-gray, Mity, rived with intereck SAND: very light brown, very fine-grained to sity.	CONTRACTOR: Groundwater	Protectio	n Irc.	DATE	STARTED:	3, 24, 93		COMPLTD: 3 14	¥3
SAND: very light brown, very fine-grained to sitty.	METHOD: 4.25" HSA		CASE SIZE: 2 mcn	SCREE	EN INT.: →	- 1 . F.	PROT	ECTION LEVEL: 3	
SANC: prowningray, silty, five owith itserock SANC: prowningray, silty,	TOC ELEV.: 12.12 FT.		MONITOR INST.: 074	TOT	PTH: 14FT		OPTH	TO I 183 FT	ALF DE STATE
SAND: brown-gray, sity, mixed with inhereck SAND: brown-gray, sity, mixed with inhereck HILL	LOGGED BY: R. Durnam		WELL DEVELOPMENT D	ATE: 3/25/93			SITE	: Bidg. 103. Pawer P	ar:
SAND: brown-gray, silty, mixed with limerack SAND: very light brown, very fine-grained to silty. SAND: very light brown, very fine-grained to silty. THE HELD HELD HELD HELD HELD HELD HELD HE	DEPTH A LANGERY SAMPLE SAMPLE SAMPLE SAMPLE	HEADSPACE (ppm)				LTHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL FIATA
	5——————————————————————————————————————	0 2 5	AND: very light brown, very						

			WELL: - / A - 103 - M.	/·	BOHI	ING NO. 3831	
CLIENT: SCUTHNAVFAC	ENGCOM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwa	ater Protec	tion inc.	DATE STARTED: 3	3/24193		COMPLIED: 3/24	93
METHOD: 4.25" HSA		CASE SIZE: 2 mch	SCREEN INT.: 4	- 14 FT.	PROTE	ECTION LEVEL: 3	
TOC ELEV.: 11.39 FT.		MONITOR INST.: OVA	TOT DPTH: 14FT.		DPTH	TO I 6.78 FT.	
LOGGED BY: R. Durham		WELL DEVELOPMENT DATE: 3/3	25/93		SITE:	Blag. 193, Power P.	ar:
SAMPLE ID. SAMPLE SAMPLE	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPT AND COMMENTS	ion .	11THOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	Wf 11 () V V
5—		SAND: brown-gray, very fine-grains with limerock SAND: very light gray, very fine-gramixed with limestone cobbles					

01.75	NT: SOUT	- LANANA	,		. L.C	OG of WELL: KYM-183-			ING NO. 5832	
	··· · · · · · · · · · · · · · · · · ·				etion Inc.	DATE STARTER		PRO	JECT NO: 7519-30	
	HOD: 4.25		water			DATE STARTED	·		COMPLIED: 3/24	- 93
					CASE SIZE: 2 inch	SCREEN INT.:			ECTION LEVEL: 0	
	ELEV.: 10 SED BY:		~		MONITOR INST.: OVA	TOT DPTH: 14FT			TO 7 6,20 FT.	
		n. Juire	'		WELL DEVELOPMENT DATE	:. 3/25/93		SITE	: Biog: 103, Power P	301
DCP1H F.T	LABOFAT SAMPLE	SAMPLE SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESC AND COMMEN		LEDHOLOGIC Symbol	SOIL CLASS	SLCWS/8-IN	WELL DATA
				0				:		-
	İ						+ +			
- -			!	0	SAND: brown-gray, very fine-g with limerock, clay lenses from 3	rained to siity, mixed 3 to 5' bis				
5										
0		,			SAND: light tan, very fine-graine limestone pebbles, slight sulfur o	ed to silty, mixed with dor				
-						·				
5—					•					
					•					
	•			-						
1										
+										
						,				•

TITLE: NAS Key West, Truman Annex	LOG	of WELL: # (%-103-MA	2	BORI	NG NO. 3833	TO THE REAL PROPERTY AND ADMINISTRATION OF THE PARTY AND ADMIN
CLIENT: SOUTHNAVFACENSCOM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwater Protection	nc. :-	DATE STARTED: 3	134193		COMPLIE: 3-24	93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 4 -	14 FT.	PROTE	ECTION LEVEL: 0	
: TOC ELEV.: 10.61 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.		DPTH	TO 7 5.88 FT.	
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE:	3/25/93		SITE:	Brag. 103, Power P	.ar:
				ASS		<
DEPTH F1. F1. G1.22 G1.22 SAMPLE RECOVERY HEADSPACE	SCIL/ROCK DESCR AND COMMENT		LTTHGLOGIC S MBOL	SOIL CLAS	8L0#5/6-[N	WELL DATA
O ASP	HALT		II			
0 SAN ~10	ID: gray to light brown, very to 15% clay, some limerock per t	ed to silty, mixed with				
15—						
20—	PAGE 1 of t	03-MW24 ABB	ENVIRO	NMEN	TAL SERVICES	S. INC.

	້າຍ ຫລ ຸ Δາດ	E*	LOG of WELL: KYW-103-1	W25	e or	ING NO. SB34	
CLIENT: SOUTHNAVEA	CENGCOM				PRO.	JECT NO: 7519-30	
CONTRACTOR: Grounds	vater Protec	tion Inc.	DATE STARTED:	3/24/93		COMPLTD: 3,24.	23
METHOD: 4.25" HSA		CASE SIZE: 2 inch	SCREEN INT.: 4	- 14 FT.	PROT	ECTION LEVEL: 3	
TOC ELEV.: 11.28 FT.		MONITOR INST.: GVA	TOT DPTH: 14FT		DPTH	TO Q 8.00 FT.	
LOGGED BY: R. Durhar	ņ	WELL DEVELOPMENT	DATE: 3/25/93		SITE	: 6; ag. 103; Power P	er t
H L LABORATORY DELL'H SAMPLE ID. SAWLE	RECOVERY HEADSPACE (ppm)		DESCRIPTION MMENTS	LITHULUGIC SYMBOL	SOIL CLASS	SLOWS/6-IN	WELL LIALA
5—	0	SAND: brown-gray, very fin 20% clay, some sandy clay pebbles SAND: light tan, very fine-glimestone pebbles, slight pe	grained to silty, mixed with				

TENT, COUTTINE OF	CVCCOM				PROJE	ECT NO: 7519-30	
CLIENT: SOUTHNAVFAC		han Inc	DATE STARTED:	· 3/25/93	111001	COMPLTD: 3/25/	
CONTRACTOR: Groundwi	ater Protec				PROTE	ECTION LEVEL: 0	
METHOD: 4.25" HSA		CASE SIZE: 2 inch					
TOC ELEV.: N.99 FT.		MONITOR INST.: 0VA	* TOT OPTH: 14FT		·	TO \$ 6.77 FT.	
OGGED BY: R. Durnam		WELL DEVELOPMENT DAT	E: 3/26/93			Bidg, 103, Power P	
H LASORATORY BINES	RECOVERY HEADSPACE (ppm)	SOIL/ROCH DES AND COMM		LI THOLOGIC SYMBOL	SOH CLASS	BLOWS/8-iN	WELL DATA
5	0	CLAYEY SAND: brown-gray, viciayey SANDY CLAY: brown-gray, slight tan to brown-gray silty, mixed with limestone pet	gnt sulfur odor , y, very fine-grained to		CL		

TITLE: NAS Key west.	Σruman irr ——	e. LO	G of WELL: 4 - 4-103-	MALT	BOR	ING NO. BEBR	
CLIENT: SCUTHNAVFA:	CENGCOM				PROJ	JECT NO: 7519-30	
CONTRACTOR: Groundw	ater Protes	ot on Inc.	DATE STARTED	: 3, 25, 93		COMPLITD: 3 25	93
METHOD: 4.25" HSA		CASE SIZE: 2 non	SCREEN INT.: -	1 - 12 = 1	PROT	ECTION LEVEL: C	
FOC ELEV.: 11.63 FT.		MONITOR INST.: GVA	TOT DPTH: 14FT		DPTH	TO 7 6 61 FT	- 100
.06GED BY: R. Durnam		WELL DEVELOPMENT DATE	i: 3/26/93	•	SITE:	5.dg. 103, Power P	ant
LABORATORY DE SAMPLE ID. WES	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESC AND COMMEN		LLTHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-th:	WELL DATA
5	0	CLAYEY SAND: prown-gray, ver clayey SAND: prown-gray, very fine-grayith limestone pebbles, petroleu LIMESTONE: gray, sandy	ained to silty, mixed		SC		

TITLE: NAS Key West.	. ran-gr. A.m.	LOG	of WELL: KYW-103-M	W23	BOR:	ING NO. SB37	
CLIENT: SOUTHNAVFA	CENGCOM				PROJ	JECT NO: 7519-30	
CONTRACTOR: Groundw	ater Protec	tion Inc.	DATE STARTED:	3/25/93		COMPLTD: 3/25	43
METHOD: 4.25" HSA		CASE SIZE: 2 inch	SCREEN INT.: 4	- 14 FT	PROT	ECTION LEVEL: 0	
TOC ELEV.: 11.17 FT.		MONITOR INST.: 0 VA	TOT DPTH: 14FT.		DPTH	TO \$ 6.18 FT.	
LOGGED BY: R. Durhan	n	WELL DEVELOPMENT DATE:	3/26/93		SITE	Blag. 103. Power P	lant
DEPTH F T.	RECOVERY HEADSPACE (ppm)	, SOIL/ROCK GESCRI AND COMMENT		L11H0L061C SYMBOL	S01L CLASS	BLOWS/6-IN	WELL DATA
5	O O	CLAYEY SAND: brown-gray, very clayey SAND: brown-gray, very fine-grawith lime CLAY: gray to tan, mixed with wo creosote odor SAND: tan, silty, mixed with limest fragments, creosote odor	ained to silty, mixed od fragments,		CL		

TITLE: MAS key west, Tr	uman in	e. LOG	of WELL: A FRENCH SH	'w29	30R	ING NO. SE38		
CLIENT: SOUTHNAVEACE	NGCOM				PROJECT NO: 7519-30			
CONTRACTOR: Groundwat	er Protes	tion Inc.	DATE STARTED: 3/25,					
METHOD: 4.25" HSA		CASE SIZE: 2 inch	SCREEN INT.: 4	- 14 57.	PROT	ECTION LEVEL: 3		
TOC ELEV.: 10.63 FT.		MONITOR INST.: 074	TOT DPTH: 14FT.		DPTH	TO 7 5.83 ==		
LOGGED BY: P. Durham		WELL DEVELOPMENT DATE:	3/26/93		SITE:	Blag. 103. Power P	Э°:	
ELABORATORY HELE SAMPLE ID. SAMPLE SA	HEADSPACE (ppm)	, SOIL/ROCK DESCRI AND COMMENT		LITHOLOGIC SYMBOL	SUIL CLASS	BLOWS/6-IN	WEET 13A 1A	
	5	CONCRETE		N = 1 = 1	SM		() () () () () () () () () ()	
	3				J	•		
	2	SAND: brown-gray, very fine-gra	nined to silty			·		
5—								
10 —		SAND: brown to tan, very fine-gr with limerock	ained to silty, mixed					
15					·			
0	Canada	PAGE 1 of 103	R-MW20 ADD	ENVIRON	IMENIT	AL SERVICES.	TNC	

051100011		OG of WELL: r rx=1€3=Y 		PROIS	EOT NO: 7519-30	
	on Inc	DATE STARTED	3/26/93	111000		<u>ن</u> د
vater Protecti				PROTE		
	WELL DEVELOPMENT DAT	E: 3/2//93			Brag. Ca, Fawer F	
RECOVERY HEADSPACE (ppm)				SOIL CLASS	BLCWS/6-IN	WEEL 13A.1A
	SAND: brown-gray, very fine-	grained to silty, some		SM		
		grained to silty, mixed				
	RECOVERY HEADSPACE (Optm)	CASE SIZE: 2 Inch MONITOR INST.: 0VA WELL DEVELOPMENT DAT SOIL/ROCK DES AND COMME CONCRETE SAND: brown-gray, very fine-clay and limerock	SAND: brown-gray, very fine-grained to silty, mixed CASE SIZE: 2 inch SCREEN INT.: 4 MONITOR INST.: 0VA TOT DPTH: 14FT. WELL DEVELOPMENT DATE: 3/27/93 SOIL/ROCK DESCRIPTION AND COMMENTS SAND: brown-gray, very fine-grained to silty, some clay and limerock SAND: brown-gray, very fine-grained to silty, mixed	CASE SIZE: 2 inch CASE SIZE: 2 inch MONITOR INST.: 0VA TOT DPTH: MAFT. WELL DEVELOPMENT DATE: 3/27/93 SOIL/ROCK DESCRIPTION AND COMMENTS CONCRETE SAND: brown-gray, very fine-grained to silty, some clay and limerock SAND: brown-gray, very fine-grained to silty, mixed SAND: brown-gray, very fine-grained to silty, mixed	CASE SIZE: 2 inch CASE SIZE: 2 inch MONITOR INST.: 0VA TOT DPTH: 14FT. DPTH WELL DEVELOPMENT DATE: 3/27/93 SITE: AND COMMENTS CONCRETE SAND: brown-gray, very fine-grained to silty, mixed SAND: Drown-gray, very fine-grained to silty, mixed CASE SIZE: 2 inch SCREEN INT.: 4 - 14 FT. PROTECTION LEVEL: D	

		re (: LOG	of WELL:		BOR	ING NO. SE39	
CLIENT: SCUTHNAVFACE					. PRO	JECT NO: 1519-30	
CONTRACTOR: Groundwa	ter Protec	otion Inc.	DATE STARTED	D: 3.35/93		COMPLITO: 3 25	. 2.3
METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 0	
OC ELEV.: FT.		MONITOR INST.: 0VA	TOT DPTH: 7=3		DPTH	то д эт.	
OGGED BY: 9. Durnam		WELL DEVELOPMENT DATE:			SITE	Blag 103, Power P	ar:
E LABORATORY d E SAMPLE ID. WE S	RECOVERY HEADSPACE (ppm)	, SOIL/ROCK DESCRI AND COMMENT		LTTHULDGIC SYMBOL	SOIL CLASS	5LDW5 6-IN	WELLIALA
	0	SAND: brown, very fine-grained to some gray limerock	silty with clay.		SM		

TITLE: NAS Key west	. Truma	ու 4րդ	LOG of	WELL:		BOR	ING NO. SE4"	
CLIENT: SOUTHNAVE	CENGO	COM				PRO	JECT NO: 15/9-30	
CONTRACTOR: Ground	water f	Protec	tion inc.	DATE STARTED:	3/26/93		COMPLIE: 3/26	93
METHOD: 4.25" HSA			CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
TOC ELEV.: FT.			MONITOR INST.: OVA	TOT DPTH: SET.		DPTH	1 TO ⊋ ==	
LOGGED BY: R. Durna	m		WELL DEVELOPMENT DATE:				: 6.43. 103. Power P	iari:
H LASORATORY Y BELL LASORATORY Y BELL LOS SAMPLE 10. SAMPLE 10.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTI AND COMMENTS	ON.	LTHOLOGIC SYMBOL	SOIL CLASS	BLC w5/6-(N	WELL UATA
		0 0	SAND: tan to _int brown, very fine-g some clay and limerock	grained to silty,				
5—					+ +			
10			PAGE 1 of 103-					

TITLE: NAS key west	. Tumar.arn	E.	6 of WELL:		BORI	NG NO. SE41	
CLIENT: SOUTHNAVEA	ACENGCOM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Ground	water Protec	tion Inc.	DATE STARTED	: 3, 25, 93	-	COMPLITD: 3/25/	/ 93
METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROTE	CTION LEVEL: 0	
TOC ELEV.: FT.		MONITOR INST.: 0VA	TOT DPTH: SFT.		OPTH	ТО ⊈ = ₹.	
OGGED BY: R. Durna	m	WELL DEVELOPMENT DATE:			SITE:	Brag. 103, Power P	ant
H LABORATORY TO LEAD HE SAMPLE ID. SAMPLE SAMPLE	RECOVERY HEADSPACE (ppm)	SOIL/ROCK GESCR AND COMMEN		LETHOLOGIC SYMBOL	Soll CLASS	B∟CWS/8-IN	WEEF 11A LA
5—	0	SAND: tan to light brown, very fir clay fraction increasing with dep pieces at 5° bis	ne-grained to silty, th, broken asphalt		SM		

CONTRACTOR Grunowase Protection for DATE STARTED 3/25-93 COMPTION 2/25-93	TITLE: NAS Key West.	ruman-Anne	() 	LOG of WELL:		BORI	NG NO. 5843	
ASTRONOLOGICAL PROPERTY OF THE	CLIENT: SOUTHNAVFAC	CENGCOM				PROJ	ECT NO: 7519-30	
TOO ELEV. FT. MONITOR INST. 3.4 TOT DPTH: SET. OPTH TO I FT. COGED BY: R. Duman WELL DEVELOPMENT DATE: SITE 8 op 103 Follow 9 of 10 op 1	CONTRACTOR: Groundw	ater Protect	ion Inc.	DATE STARTED:	3/25/93		COMPLTD: 3/25/	93
OCELEVAL FT. MONITOR INSTADAVA TOT DPTH SET. DPTH TO T FT. COGED BY: R. Duman MELL DEVELOPMENT DATE: SITE Bits 102 103 104 104 104 104 104 104 104 104 104 104	METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROTE	ECTION LEVEL: S	
SAMPLE ID O SAMPLE			MONITOR INST.: 3VA	TOT DPTH: SET.		DPTH	TO 7 = T.	
SAND: gray-brown, very fine-graned to sitty, some aspinal and diay CL CLAY: brown-gray, sandy, silty	OGGED BY: R. Durnam		WELL DEVELOPMENT DA	TE:		SITE:	Blag 103 Power P	art
SANC: gray-brown, very fine-grained to sitty, some aspinal and diay CLAY: brown-gray, sandy, sitty	E LABORATORY WE WAS SAMPLE ID. W	RECOVERY HEADSPACE (ppm)			LI FHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	
CLAY: brown-gray, sandy, silty		0		-grained to silty, some		SM		
CLAY: brown-gray, sandy, silty		O	,					
		30				CL		-
	-	1	CLAY: brown-gray, sandy, si	lty				
	5—							
	-							
				•				
			,					
	10				-			

TITLE: NAS Key west.	Truman Ann	e ·	LOG of	WELL:		BOR	ING NO. SB44	
CLIENT: SOUTHNAVFA	CENGCOM					PRO	JECT NO: 7519-30	
CONTRACTOR: Groundw	ater Protec	tion Inc.	!	DATE STARTED:	3/25/93		COMPLTD: 3/25	- 33
METHOD: 4.25" HSA		CASE SIZE:		SCREEN INT.;		PROT	ECTION LEVEL: C	
TOC ELEV.: FT.		MONITOR INST.: 0	/Δ .	TOT DPTH: 5FT.			TO 7 FT.	
LOGGED BY: R. Durnam	1	WELL DEVELOPMEN	IT DATE:			SITE	Blag. 103. Power P	lant
DEPTH CAMPLE TO: SAMPLE TO: SAMPL	RECOVERY HEADSPACE (ppm)		CK DESCRIPTI COMMENTS	ИС	SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL UATA
5	20 E	FILL: sand and asphalt, strong petroleum odor SAND: very fine-grained pebbles and clay SAND: very fine-grained	to silty, som	e limerock		SC		JW.
		·						
		. PAGE	1 of 103-S	<u> </u>	ENVIRON	MENT	AL SERVICES.	INC.

Truman, Annek	LOG o	f WELL:		BORI	NG NO. SB45	
CENGCOM				PROJ	ECT NO: 7519-30	
	Inc.	DATE STARTED:	3/25/93		COMPLID: 3/25.	. 43
······································	CASE SIZE:	SCREEN INT.:		PROTI	ECTION LEVEL: 3	
		TOT DPTH: 5FT.		DPTH	TO 7 FT.	
m						ant
RECOVERY HEADSPACE (ppm)			LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0		ned to silty, ~10%		5M		
	RECOVERY BANGO O HEADSPACE MODES OF THEADSPACE	CENSCOM Nater Protection Inc. CASE SIZE: MONITOR INST.: OVA MELL DEVELOPMENT DATE: SOIL/ROCK DESCRIP AND COMMENTS O SAND: brown-gray, very fine-grain limerock pebbles	CENGCOM Water Protection Inc. CASE SIZE: MONITOR INST.: 9VA MELL DEVELOPMENT DATE: SOIL/ROCK DESCRIPTION AND COMMENTS O SAND: brown-gray, very fine-grained to silty, ~10% Himerock pebbles	CASE SIZE: SCREEN INT.: MONITOR INST.: 3VA TOT DPTH: 5FT.	CENGCOM Water Protection Inc. CASE SIZE: CASE SIZE: MONITOR INST.: 0VA MONITOR INST.: 0VA MELL DEVELOPMENT DATE: SITE: SOLUTROCK DESCRIPTION AND COMMENTS O CASE SIZE: SCREEN INT.: PROTE MONITOR INST.: 0VA TOT DPTH: SFT. DPTH SITE: SYMBOO SAMD: brown-gray, very fine-grained to silty, ~10% Immerock pebbles	CENSCOM PROJECT NO: 15/9-30 Nater Protection Inc. DATE STARTED: 3/25/93 CASE SIZE: SCREEN INT.: MONITOR INST.: 0VA TOT DPTH: 5-7. DPTH TO 7, -7. MELL DEVELOPMENT DATE: SITE: Bidg. 103, Power P AND COMMENTS SM O SAND: brown-gray, very fine-grained to silty, ~10% Illimerock pebbles

TITLE: NAS Key West.	'uman.⊸nre		LOG of WELL:		BORI	ING NO. SE46	
CLIENT: SOUTHNAVEAC	CENGCOM			· · · · · · · · · · · · · · · · · · ·	PROJ	JECT NO: 7519-31	
CONTRACTOR: Groundw	ater Protect	ion Inc.	DATE STARTED	: 3/26/93		COMPLIE: 3 26	÷3
METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 5	
TOC ELEV.: FT.		MONITOR INST.: OVA	TOT DPTH: 5FT.		DPTH	TO \$ FT.	
LOGGED BY: R. Qurham		WELL DEVELOPMENT	DATE:		SITE:	B-33, 103, Power P	311
H LABORATORY DA SAMPLE IO. S	RECOVERY HEADSPACE (ppm)		DESCRIPTION MMENTS	ct factodic Symbol	SOIL CLASS	510 #5. 6+04	WELL DATA
5	0	SAND: pale gray, very fine-	grained to clayey		SC		

CLIENT: SCUTHNAVFACENGO CONTRACTOR: Groundwater f METHOD: 4.25" HSA TOC ELEV.: FT. LOGGED BY: R. Durham HI J LABGRATORY SAMPLE ID. SAMPLE ID. SAMPLE ID.	Protection Inc. CASE SIZE: MONITOR INST.: 3VA WELL DEVELOPMENT I		PROTECT DPTH TO SITE: 5::	TINO: 1519-30 COMPLTD: 3-26 FION LEVEL: D DID: FI ag. 103: Power Pt BLOWS/6-IN	ar:
CONTRACTOR: Groundwater F METHOD: 4.25" HSA TOC ELEV.: FT. LOGGED BY: R. Durham	Protection Inc. CASE SIZE: MONITOR INST.: DVA WELL DEVELOPMENT (SOIL/ROCK AND CO	SCREEN INT.: TOT DPTH: SET. DATE:	PROTECT DPTH TO SITE: 513	FION LEVEL: D) Ç FT ag. 103. Power Pt	ar:
TOC ELEV.: FT. LOGGED BY: R. Durham	MONITOR INST.: DVA WELL DEVELOPMENT (bbm) SOIL/ROCK AND CO	; TOT DPTH: SET.	SITE: 5::) Ç. FT ag. 103. Pawer P1	
TOC ELEV.: FT. LOGGED BY: R. Durham	WELL DEVELOPMENT (bbm) SOIL/ROCK AND CS	DATE:	SITE: 61	ag. 193. Power Pr	
LOGGED BY: R. Durham	HEAUSPACE (ppm)		Ct ASS		
		CESCRIPTION 010HILL 1	OIL CLASS	BLOWS/6-IN	<u> </u>
	0		S	·	WELL DATA
5	SAND: pink-tan, very fine-fraction increasing with de		SC		

.

TITLE: NAS Key west. Truma	ar Anne	. L(DG of WELL:		EOR!	NG NO. 5848	
CLIENT: SOUTHNAVEACENG	COM				PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwater	Protection Inc.		DATE STARTED:	3/26/93		COMPLTD: 3 T26	. 93
METHOD: 4.25" HSA	CA	SE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: C	<u></u>
TOC ELEV.: FT.	MOI	NITOR INST.: 074	TOT DPTH: 5FT.		DPTH	TO Ç FT	
LOGGED BY: R. Durham	₩E	L DEVELOPMENT DAT	≣:	-	SITE:	Bidg. 103, Power P	ar:
DEPTH FT. FT. OI BIGMAS SAMPLE SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESC AND COMME		. 11 ТНОГОБІС 5 тМВОГ	SOIL CLASS	5LC#5/6-[N	WELL LIALA
	SAND/F	[LL: red and tan, fine-	to medium-grained	K A A A A A A A A A A A A A A A A A A A		·	
	23	ay, very fine-grained					
5—							
10—		PAGE 1 of 1	03-SB/8 ADD	ENVIDON	MENT	AL SERVICES.	INC

FITLE: NAS Key West, Trum	tani Annev : LOI	G of WELL: -	BOf	RING NO. 3849	
 CLIENT: SOUTHNAVFACENG	3COM		PR(DJECT NO: 7519-30	*****
CONTRACTOR: Groundwater		DATE STARTED: 3	/26/93	COMPLTD: 3 16	93
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PRO	TECTION LEVEL: 3	
TOC ELEV.: FT.	MONITOR INST.: 0VA	TOT DPTH: SET.	DPT	4 TO 7 FT.	
LOGGED BY: R. Durnam	WELL DEVELOPMENT DATE		SITE	E: Bidg. 193, Power P	ar:
DEFTER SAMPLE COVERY	HEADSPACE (ppm) Wammod dna (ppm)		LTHOLOGIC SYNBOL SUIL CLASS	BLOWS/6-IN	WELL DATA
5-	SAND: tan, medium-grained to continuestone peobles CLAY: gray, sandy, soft, petron	ay Hayey with some			

TITLE: NAS Kev west. Trum	an Annex	LOG of WELL:		BOR	ING NO. 3951	
CLIENT: SOUTHNAVFACENS	COM .			PRO	JECT NO: 7519-30	
CONTRACTOR: Groundwater	Protection Inc.	DATE STAR	TED: 3/26/93		COMPLITO: 3/36	43
METHOD: 4.25" HSA	CASE SIZE:	SCREEN IN	Т.:	PROTE	ECTION LEVEL: 0	
TOC ELEV.: FT.	MONITOR INST	.: OVA TOT DPTH:	5FT.	DPTH	TO 7 =	
LOGGED BY: R. Durham	WELL DEVELOP	MENT DATE:		SITE:	814g. 103, Power P	ar:
DEPTH F1 F1 F1 G1 BANDS G1 BANDS SAMPLE RECOVERY		/ROCK BESCRIPTION AND COMMENTS	S YMBOL 11 PHOLUGIE	SUIL CLASS	BL0WS/6-[N	WELL DATA
5	O SAND/FILL: gray an medium-grained, siig	e- to medwum-grained, some n ododr				
0		GE 1 of 103-SB50 A				

	Truman, Anne	; (LOG of WELL:		BORI	NG NO. 9851	
CLIENT: SOUTHNAVFA	CENGCOM				PROJ	ECT NO: 15:9-30	
CONTRACTOR: Groundy	water Protec	tion Inc.	DATE STARTED	D: 3-26/93		COMPLTD: 3/26	93
METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.		PROTE	ECTION LEVEL: 3	
TOC ELEV.: FT.		MONITOR INST.: 0V	A TOT OPTH: 5FT		DPTH	TO 7 = 1.	
LOGGED BY: R. Durha	m	WELL DEVELOPMEN	T DATE:		SITE:	Biag, 103, Power P	ant
DED THE COMMENT OF TH	RECOVERY HEADSPACE (ppiii)		K DESCRIPTION COMMENTS	LI THOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5	± 1 0		cx, fine-grained to pebbly				

				OG of WELL:			BORING NO. 3852		
CLIENT: SOUTHNAVFACEN	IGCOM				PRO	JECT NO: 7519-30	A.W		
CONTRACTOR: Groundwate	r Protection	Inc.	DATE STARTE	D: 3/26/93		COMPLTD: 3/2	6-93		
METHOD: 4.25" HSA		CASE SIZE.	SCREEN INT.:		PROTECTION LEVEL: 0				
OC ELEV.: FT.		MONITOR INST.: 074	TOT DPTH: 5F	Ī.	DPTH	TO Ç FT.			
OGGED BY: R. Durham		WELL DEVELOPMENT DA	ATE:		SITE:	Bidg" 103, Power	P-Br ·		
SAMPLE IC. SAMPLE IC.	HEAUSPACE (ppm)	SCIL/ROCK DE AND COM		LITHOLOGIC SYMBOL	SUIL CLASS	BLOWS. 6-IN	WELL UALA		
	0 SAI	PHALT ND/FILE: gray and black, arse-grained, broken cond ND: pink-gray, clay to con	crete		SW				
5—	50 CLA	Y: gray, soft, sandy, very	/ strong sulfur odor		CL				

TITLE: MAS Key	у морок.	J. 13. E 4.11.		LOG of WELL:		BOR	ING NO. BESS	
CLIENT: SOUTH	NAVEACE	ENGCOM				PRO.	JECT NO: 7519-30	-
CONTRACTOR: 6	Groundwa	ter Protec	tion Inc.	DATE STARTE	D: 3/26/93		COMPLIE: 3/28	- 93
METHOD: 4.25"	HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
TOC ELEV.: FT			MONITOR INST.: 0VA	TOT DPTH: 5F	Τ.	ОРТН	70 7 FT.	
LOGGED BY: R.	Durnam	-	WELL DEVELOPMENT	DATE:		SITE	: Bidg: 103, Power F	Pian:
H LASCRATOR B L SAMPLE II	SAMPLE	RECOVERY HEADSPACE (ppm)		DESCRIPTION CMMENTS	LTTHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	ME (1 1)A IA
_		0	ASPHALT SAND/FIEL: tan, very fine some limestone pebbies SAND: pink-gray, very fin shell fragments			SC		
5			CLAY: gray, soft, sandy, s	some petroleum odor			·	
10								-

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		LO	G of WELL:		BOR	ING NO. SES4	
LIENT: SOUTHNAVFACEN	GCOM				PRO	JECT NO: 7519-33	
ONTRACTOR: Groundwater	r Protectio	on Inc.	DATE STARTED:	3 26/93		COMPLTD: 3/26	- 33
ETHOD: 4.35" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
OC ELEV.: FT.		MONITOR INST,: 0VA	TOT DPTH: SFT.		DPTH	TO V FT.	
DGGED BY: R. Durnam		WELL DEVELOPMENT DATE			SITE:	: Bldg. 103, Power P	lan t
SAMPLE SAMPLE	HEADSPACE (ppm)	, SOIL/ROCK DESCF AND COMMEN		SYMBUL SYMBUL	SOIL CLASS	BLOWS/8-IN	WLIE DATA
	0 S	AND: pink-tan, clayey with small	m-grained, 30%		5W CL		

ITLE: NAS Key west, Tr	ruman, Annex	LO	G of WELL:		BORI	NG NO. SE55	
LIENT: SOUTHNAVFACE	INGCOM				PRCJ	ECT NO: 7519-30	
ONTRACTOR: Groundwat	ter Protection Inc		: DATE STARTED:	3/26/93		COMPLTD: 3/26	43
METHOD: 4.25" HSA	C	ASE SIZE:	SCREEN INT.:		PROTE	ECTION LEVEL: 0	
OC ELEV.: FT.	- MI	ONITOR INST.: OVA	; TOT DPTH: 5FT.		OPTH	TO 7 ==	
OGGED BY: R. Durnam	: W	ELL DEVELOPMENT DATE	;		SITE:	Bidg. 103, Power P	ar:
E LABORATORY BANK LE LE LABORATORY BANK LE LO. WANTE LO.	RECOVERY HEADSPACE [ppm]	SOIL/ROCK DESC AND COMME		LITHOLOGIC SYMBOL	SOIL CLASS	BLO _M S√6-IN	WFII []A !A
5	ASPHA 1 SAND/ sneil fr 0 SAND:	FILL: dark prown, very, fagments and limestone prink-gray, very fine-gray	ebbles ained to clayey	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	SC		
-							

TITLE: NAS Mey West, Trus	nan, Anrex		LOG of WELL:			BOR	ING NO. 3886	
CLIENT: SOUTHNAVFACEN	GCOM					PRO	JECT NO: 7519-30	
CONTRACTOR: Groundwater	r Protection	Inc.	DATE	STARTED: 3	26/93		COMPLTD: 3/26	93
METHOD: 4.25" HSA		CASE SIZE:	SCRE	EN INT.:		PROT	ECTION LEVEL: C	
TOC ELEV.: FT.		MONITOR INST.: 074	ТОТ	OPTH: 5FT.		DPTH	TO T = T	
LOGGED BY: R. Durham		WELL DEVELOPMENT	DATE:			SITE	: Brag. 103, Power P	ant
DEPTH PT. FT. GGLEVEST CGLEVEST SAMPLE SAMPLE	HEADSPACE (ppm)		. DESCRIPTION COMMENTS		LTHOLOGIC	SOIL CLASS	BLOWS/6-IN	WELL DATA
	O SA inme	PHALT NC/FILL: tan, fine- to obles ND: pink-tan, clayey to estone peddles AY: gray, soft, sandy, s	o fine-grained, 15	% arge	1	CL		
0		PAGF 1	of 103-SB56	ABB F	 ENVIRON	 MENT	AL SERVICES.	INC.

TITLE: NAS Key West, Truman, And	e. LOG	of WELL:		BORI	NG NO. BEET	
CLIENT: SOUTHNAVFACENGCOM				PROJE	ECT NO: 7519-30	
CONTRACTOR: Groundwater Protection	otion Inc.	DATE STARTED:	3-26/93		COMPLTD: 3/16	93
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:		PROTE	CTION LEVEL: 3	-
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 5FT.		DPTH	TO Z FT.	
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE:			SITE:	Bidg. 103, Power P	ar:
DEPTH FILE FILE BY B	SOIL/ROCK DESCRI AND COMMENT		SYMBOL	SOIL DLASS	BLOWS/8-IN	WET 1141A
26	ASPHALT SAND/FILL: tan and black, very fine-grained, concrete and limes SAND: pink-grey, clayey to fine-pebbles CLAY: gray, soft, sandy, petrolet	tone pebbles -grained, limestone	~	CL		
10—						

CLIENT SOUTHWARE PROPERTY (Inc.) CATE STARTED, 3:04-93 COMMITTOR (Inc.) CATE STARTED, 3:04-93 CASE SIZE. CASE SIZE. COMMITTOR (Inc.) CATE STARTED, 3:04-93 CASE SIZE. COMMITTOR (Inc.) CATE STARTED, 3:04-93 CASE SIZE. CASE SIZE. CATE STARTED, 3:04-93 CASE STARTED,	TITLE: NAS Key west, Trus	man_Aone.	· : L	OG of WELL:		BOR	ING NO. 3853	
METHOD: 4.25" HSA CASE SIZE: SCREEN INT:: PROTECTION LEVEL: 0 TOC ELEV.: FT. MONITOR INST:: 0V4 TOT DPTH: SFT OPTH TO T FT LOGGED BY: R. Durnam WELL DEVELOPMENT DATE: SITE: 5 to 103 Power Plan: E 1 - SAMPLE TO WE WELL DEVELOPMENT DATE: SITE: 5 to 103 Power Plan: B 1 - SAMPLE TO WE WELL DEVELOPMENT DATE: SITE: 5 to 103 Power Plan: B 1 - SAMPLE TO WELL DEVELOPMENTS SOLL/ROCK DESCRIPTION AND COMMENTS O SAND: tan, fine- to coarse-grained, 20% limestone Cobbles	CLIENT: SOUTHNAVFACEN	GCЭM				PRO	JECT NO: 7519-30	
MONITOR INST.: 004 TOT OPTH; SET DEPTH TO I ST LOGGED BY: R. Durnam MELL DEVELOPMENT DATE: SITE: 5 to 103 Power Plant SULVACCK DESCRIPTION AND COMMENTS O SAMPLE ID SY DO DE ST O SAND: tan, fine- to coarse-grained, 20% limestone Cobbles O SAND: tan, fine- to coarse-grained, 20% limestone	CONTRACTOR: Groundwater	r Protection Inc.		DATE STARTED	D : 3/26/93		COMPLTD: 3 26	- 93
WELL DEVELOPMENT DATE: SITE: 5 20 103 Pawer Plant SITE:	METHOD: 4.25" HSA	CA	SE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
SOIL/ROCK DESCRIPTION AND COMMENTS ALC/AS/8-IN III O SAND: tan, fine- to coarse-grained, 20% limestone Cobbles O SAND: tan, fine- to coarse-grained, 20% limestone Cobbles	TOC ELEV.: FT.	моі	NITOR INST.: 0V4	TOT DPTH: 5FT		DPTH	TOŢFT	
SAND: tan, fine- to coarse-grained, 20% limestone Cobbles	LOGGED BY: R. Durnam	WEI	LL DEVELOPMENT DAT	TE:		SITE:	B dg 103 Power P	'a^!
SAND: tan, fine- to coarse-grained, 20% limestone cobbles	DEPTH DEPTH OF HIGHWAS OF TO THE SAMPLE SAMPLE	HEADSPACE (ppm)			LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
		O SAND: te	an, fine- to coarse-gr	ained, 20% limestone				

DATE STARTED: 3/26/93 COMPLTD: 8:06-93 ETHOD: 4:25' HSA CASE SIZE: SCREEN INT.: PROTECTION LEVEL: C OC ELEV.: FT MONITOR INST.: CVA TOT DPTH: SST. DPTH TO \$ FT. DOGGD BY: R Durnam WELL DEVELOPMENT DATE: SITE: B cg. 103. Power Pan: ET LARGRATORY & SOUR BY: A DOGGD BY: R DURNAM AND COMMENTS O SAMPLE ID. 8 SOUR SOUR BY: A DOGGD	ITLE: NAS Key West, Truman Arrek	LOG	of WELL: -		BOR:	ING NO. 3859	
ETHOD: 425" HSA CASE SIZE: SCREEN INT.: PROTECTION LEVEL: C OCC ELEV.: FT MONITOR INST.: CVA TOT OPTH: SFT DPH TO Q FT SITE: 8 39, 103, Power Pan: LARGRATORY BY	CLIENT: SOUTHNAVFACENGCOM				PRO	JECT NO: 7519-30	
OCELEVI: FT MONITOR INSTITEVA TOT OPTH: SFT DPTH TO T FT OGGED BY: R Durnam WELL DEVELOPMENT DATE: SITE: Big: C3. Power Plant SOLL/ROCK DESCRIPTION AND COMMENTS SOLL/ROCK DESCRIPTION AND COMMENTS OO SAMPLE ID. SOLL/ROCK DESCRIPTION AND COMME	CONTRACTOR: Groundwater Protectio	n Inc.	DATE STARTED:	3/25/93		COMPLTD: 3, 26,	93
WELL DEVELOPMENT DATE: SITE: 8 cg. *C3. Power Plan: SITE: 8 cg.	METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
SAMPLE ID. WS SA	OC ELEV.: FT	MONITOR INST.: CVA	TOT DPTH: SFT.		DPTH	TO 🖫 🖅 .	
SAND: tan to gray, very fine— to fine—grained. Clayey, 50% limstone peobles	OGGED BY: R. Durnam	WELL DEVELOPMENT DATE:			SITE	: Bidg. 103. Power P	ar:
SAND: tan to gray, very fine- to fine-grained, clayey, 50% limstone peobles	DEPTH F1 F1 F1 F1 F2 F3 F3 F3 F3 F3 F4 F5			LJTHOLUGIC SYMBOL	SUIL CLASS	8L0WS/8-IN	WELL UATA
5			fine-grained.				

TITLE: NAS key west, Truman	u gonet	LOG of WELL:		BORING	9 NO. 5561	
CLIENT: SOUTHNAVFACENGO	ЭМ			PROJEC	T NO: 7519-30	
CONTRACTOR: Groundwater Pr	rotection inc.	DATE STARTED:	3/28/93		COMPLITO: 3 16	9.3
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:		PROTEC	TION LEVEL: I	
TOC ELEV.: FT.	MONITOR INST.: 3VA	TOT DPTH: SFT.		ортн то) 📜 = =	
LOGGED BY: R. Durham	WELL DEVELOPMENT	DATE:		SITE: 8:	ag. 103 Power P	ar:
DEPTH DEPTH TOTAL SAMPLE SAMPLE RECOVERY		SESCRIPTION DMMENTS	SYMBOL	SUII CLASS	BLOWS/6-IN	WELL DATA
5—	ASPHALT SAND/FILE: gray, very fine pebbles CLAYEY SAND: gray, claye ilmstone pebbles O					

			of WELL:		BOR:	ING NO. 336: 	
LIENT: SOUTHNAVE					PROJ	JECT NO: 7519-30	
ONTRACTOR: Ground	water Prot		DATE STARTED:	3/26/93 		COMPLIED: 3/26/	9 3
ETHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 0	
OC ELEV.: FT.		MONITOR INST.: CVA	TOT DPTH: 5=T.		DPTH	TO T FT.	
OGGED BY: R. Durha	m	WELL DEVELOPMENT DATE:			SITE:	; Blag. 103, Power P	ant
LABORATORY L SAMPLE ID. W	RECOVERY	SOIL/ROCK DESCR		LTTHOLOGIC SYMBOL	SUIL CLASS	BLOWS/6-IN	WELL DATA
	0	ASPHALT		K			
		SAND/FILL: gray-black, clayey pebbles	to fine-grained,	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
	0					·	
<u> </u>	0	CLAYEY SAND: gray, very fine- limstone peddles	to fine-grained, 20%				
5—		·		走声			
-							
-							
0—							

TITLE: NAS Key West.		LOG	of WELL:		BOR	ING NO. 3862	
LIENT: SOUTHNAVFA	CENGCOM				PRO	JECT NO: 7519-33	
CONTRACTOR: Groundw	ater Protec	tion Inc.	DATE STARTED:	3/26/93		COMPLTD: 3/26.	93
IETHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
TOC ELEV.: FT.		MONITOR INST.: 074	TOT DPTH: 3.5FT	······································		TO T =	
OGGED BY: R. Durnam		WELL DEVELOPMENT DATE:					art
L LABORATORY DIL	RECOVERY HEADSPACE (ppm)	SCIL/ROCK DESCRI And comments		LITHOLOGIC SYMBOL	SOIL CLASS	SEOMS/8-18:	WELT TIATA
	0	GRAVEL: tan, fine— to coarse grad gravel and pebbles MET REFUSAL	ned, limestone		GP .		
5—							

			DG of WELL:			NG NO. 3863	
LIENT: SOUTHNAVFA					PROJ	ECT NO: 7519-33	
ONTRACTOR: Grounds	vater Protec		DATE STARTED:	3/26/93 		COMPLTD: 3/26/	93
IETHOD: 4.25 HSA		CASE SIZE:	SCREEN INT.:			ECTION LEVEL: D	
OC ELEV.: FT.		MONITOR INST.: 0VA	TOT DPTH: 5FT.			TO 7 FT.	
OGGED BY: R. Durha	n .	. WELL DEVELOPMENT DAT	E:		SITE:	Bidg. 103, Power Pi	ar:
L LABORATORY WE WANTED OF SAMPLE ID. SO	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESC AND COMME		111H0L0GIC SYMBOL	SON CLASS	B10#5/6-IN	WELL DAIA
5—	0	SAND: gray, very fine- to coapebbles LIMESTONE: gray, sparry, san					

CLIENT: SOUTHNAVFACENO			.OG of WELL:		0011	ING NO. SE64	
	GCOM				PRO.	JECT NO: 7519-30	
CONTRACTOR: Groundwater	Protect	ion Inc.	DATE STARTED	: 3/16/93		COMPLID: 3/16	- 9 3
METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:		PROT	ECTION LEVEL: 3	
TOC ELEV.: FT.		MONITOR INST.: OVA	TOT DPTH: 5FT.		DPTH	TO T FT.	
LOGGED BY: R. Durham		WELL DEVELOPMENT DAT	ΓΕ:		SITE:	Blag. 103, Power P	iant
DEPTH FT. FT. GU 30 GU 30 AMPLE SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DES AND COMM		LÌ THOLOGIC SYMBOL	SOII CLASS	BLCWS/6-IN	WELL DATA
		SAND/FILL: gray-plack, very limestone and concrete pebbli SAND: gray, fine-grained, lime	es	T			
		CLAY: gray, soft, fine— to med strong petroleum odor	lium-grained sand,		CL		
5—							
		•	•				

TITLE: NAS Key West, Truman Anne	LOG	of WELL:		BORI	NG NO. SB65	
CLIENT: SOUTHNAVEACENGCOM	, , , , , , , , , , , , , , , , , , , ,		İ	PROJ	ECT NO: 7519-30	
CONTRACTOR: Groundwater Protect	on Inc.	DATE STARTED: 37	26/93		COMPLTD: 3/26	3 3
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	:	PROTE	ECTION LEVEL: D	
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 5FT.		DPTH	TO 7 FT.	
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE:			SITE:	Bidg. 103, Power P	ant.
DEPTH F.L. F.L. GIGLAWBER GIGLAWBER GIGLAWBER SAMPLE SAMPLE RECOVERY HEADSPACE	, SOIL/ROCK DESCRIF AND COMMENTS		LITHULOGIC SYMBOL	SOIL ULASS	BLOWS, 8-IN	W 11 () V 1 V
	SAND: brown, fine- to medium-gralimestone pebbles	ained, 30% large				

MONITOR INST.: 0VA TOT DPTH: SET. DPTH TO 7 ET. LOGGED BY: R. Durnam WELL DEVELOPMENT DATE: SITE: 5:39, 103, Power Plant SITE: 5:39, 103, Power Plant	NITLE: NAS Key west. Trums	an Annek	LOG o	f WELL:		BORI	ING NO. 3866	
ACTION LEVEL: 5 INCOME LEV.: FT MONITOR INST:: 0VA TOT DPTH: SFT. DPTH TO 2 FT SITE: 8:22, 103, Power Plant SITE: 8:22, 103, Power Plant LABORATORY H SAMPLE ID. SY SAND: brown to gray, clayey to medium-grained, small limestone pebbles DPTH TO 2 FT SITE: 8:22, 103, Power Plant SITE: 8:22, 103,	CLIENT: SOUTHNAVFACENG	СОМ				PROJ	ECT NO: 1519-31	***************************************
MONITOR INST.: OVA OGGED BY: R. Durnam WELL DEVELOPMENT DATE: SITE: Brigg: 103, Power Plant: SITE: Brigg: 103, Power Plant: Laboratory 3 4 4 5 5 6 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6	CONTRACTOR: Groundwater	Protection	Inc.	DATE STARTED: 3	/26/93		COMPLTD: 3/26	33
AND brown to gray, clayey to medium-grained, small H H H H H H H H H H H H H H H H H H	METHOD: 4.25" HSA		CASE SIZE:	SCREEN INT.:	:	PROTE	ECTION LEVEL: 3	
LABORATORY S SOIL/ROCK DESCRIPTION AND COMMENTS 2 SAND: Drown to gray, clayey to medium-grained, small limestone pebbles 0 SAND: Drown to gray, clayey to medium-grained, small limestone pebbles	TOC ELEV.: FT.		MONITOR INST.: 0VA	TOT DPTH: SET.		DPTH	TO Z FT.	
SAND: brown to gray, clayey to medium-grained, small limestone pebbles O	LOGGED BY: R. Durnam		WELL DEVELOPMENT DATE:			SITE:	Bidg. 103, Power P	lant
SAND: brown to gray, clayey to medium-grained, small limestone pebbles	DEPTH + T + T + T - CI TAVA SAMPLE SAMPLE	HEADSPACE (ppin)		FION	LLTHOLOGIC	SOIL CLASS	BLCW5/8-IN	W[11]W
	5	2 O SAN lime		dium-grained, small				

TITLE	E: 1,48 K	ey Wes	t, Trym	ian ∆ong	ex LOG	of WELL:		BCR	ING NO. 3868	
CLIE	NT: SCUT	HNAVF	ACEN	ЭССМ		·		PRO.	JECT NO: 1519-30	
CONT	RACTOR:	Ground	lwater	Protec	tion Inc.	DATE STARTED	: 3/26/93		COMPLTD: 3-26	93
METH	OD: 4.25	" =SA		****	CASE SIZE:	SCREEN INT.:	-	PROT	ECTION LEVEL: 3	
TOC	ELEV.: F	Т.			MONITOR INST.: OVA	TOT DPTH: 5FT		DPTH	TO 7 FT	
_OGG	ED BY:	R. Durh	am		WELL DEVELOPMENT DATE:			SITE	: Bidg. 103, Power P	ant.
DEP1H F1	LABORAT SAMPLE	SAMPLE	RECOVERY	HEAUSPACE (ppm)	SOIL/ROCK DESCRI AND COMMENT		LI THOLOGIC SYMBOL	SOIL CLASS	BLOWS/8-IN	WELL DATA
5—				0	SAND: yellow-tan, very fine- to mail limestone peddles	edium-grained,				
-										
10 —	_	1 1	1	١.			ı		ı	

CLERT, SOUTHAUTAGE PROTECTION ID. (DATE STARTED 3):2019 COMPLID 3 of 33 METHOD 105-SA CASE SIZE: SCREEN INT. PROTECTION LEVEL TOCKLEY, TO MONITOR INSTITUTE TO DOTH ST. DDTH TO TO TO DOTH TO TO TO DOTH TO TO TO SIZE SIZE: SCREEN INT. PROTECTION LEVEL DEVELOPMENT DATE: SIZE SIZE: SIZE: SCREEN INT. DDTH TO TO TO DOTH TO TO TO DOTH TO TO TO DOTH TO TO TO SIZE SIZE: SI	MITLE: NAS Rey west. Truman Annek		LOG of WELL:		BORI	ING NO. SBAS	
ACTION HIS HEAD CASE SIZE. SCREEN INT. PROTECTION LEVELUT COSCIONATION (INT. 0.74) TOT DETRICATION (INT. 0.74) TOT	DLIENT: SOUTHNAVFACENGOOM			····	: PROJ	DECT NO: 1519-30	
TOCELEV. TO MONITOR INST. CVA TOT DPTH; 5: DOTH TO T PTH. OGRED BY: R JUTER MELL DEVELOPMENT DATE: SITE. 2: 22: 23: 23: 23: 23: 24: 24: 25: 23: 23: 23: 23: 23: 23: 23: 23: 23: 23	CONTRACTOR: Groundwater Protection	rinc.	DATE STARTED	1: 3/26/93		COMPLITD: 3,26	93
ACCEPTION AND DEVELOPMENT DATE: SITE OF THE PROPERTY OF THE P	METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:		PROTE	ECTION LEVEL: 0	
SOLVADOR DESCRIPTION SOLVADOR DESCRIPTION		MONITOR INST.: OVA	TOT DPTH: SET		DPTH	TO I FT	
CLAYEY SAND, tan to crown, very fine— to medium—grained, limestone Debbias near surface	OGGED BY: R. Durham	WELL DEVELOPMENT DA	ATE:		SITE:	Biog. 103, Power P	ar.
CLAYEY SAND, tan to prown, very fine— to medium—grained, limestone peobles near surface	COVERY SAMPLE GOVERY HEADSPACE (ppm)			LITHOLOGIC SYMBNI	SOIL CLASS	ELCAS/8-(N	M 1.1 8) A 1.4
	O CL me	AYEY SAND: tan to brown, dium-grained, limestone pe	very fine- to bbies near surface				